THREE SCENARIOS:

A CUSTOM RESEARCH PROJECT

FOR PROJECT UNIQUE

OCTOBER, 1986

INPUT

THREE SCENARIOS: *EDI, Cellular, OLTP*

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Chapter 1

Executive Summary

This custom project examines three potential areas for Project Unique's consideration, sizing the market in two areas and providing an analysis in a third.

The findings do not point to clearly profitable areas and suggest cautious approaches. However the risks may be acceptable in two areas, specifically industry-focused, and regional EDI services for secondary suppliers in aerospace and electronics, and a regional cellular radio clearinghouse.

INPUT was unable to identify any clear opportunities in the on-line transactional services area due to markets approaching saturation. Further investigation may be in order for transactional systems (versus services) targetted towards the utility industry where project unique may be able to leverage previous business experience.

Chapter 2

INTRODUCTION

This research project examines three potential businesses for Project Unique.

1.   Electronic Data Interchange (EDI) services to the electronics and aerospace industries. The primary interest is in Just-In-Time inventory reduction applications associated with EDI. An associated, and secondary, investigated opportunity is on-line data base access related to EDI.

2.   Cellular Radio services and systems associated with "roamers" (users outside their home territory), routine and special feature billing, call data analysis and other "value added" applications of interest to cellular operators.

3.   Systems and software related to On-Line Transaction Processing (OLTP) services such as 800-response centers, related data bases, and verification/authorization

services.

As it was understood that Project Unique would be a partnership, the analysis and recommendations consider the characteristics of the alliance, and discusses some of the issues the partners must consider for any strategy to be successful.

Chapter 3

Electronic Data Interchange

3.1 EDI Defined

Electronic Data Interchange is the computer-to-computer exchange
of electronic forms of business information such as purchase
orders, invoices, bills of lading, etc. Also included in the
definition are insurance claims and logistical data such as
location messages as used in the rail and trucking industry. EDI
"documents" are in machine readable form, and EDI generally
operates in a batch, rather than interactive, mode.

3.2 An Exploding Market - The Motivators

INPUT projects that EDI will be doubling each year, growing from
a 1985 base of approximately $24 million, becoming an
approximately $2 billion dollar industry by 1991.

The reasons for this growth include the cost savings possible,

the involvement of major users, the expected integration of EDI
functions with inventory, accounting and other software
applications, and other factors.

INPUT has coined the term "cascade effect" relative to EDI.
While usage may begin with electronic purchase orders, it is
possible grow to twelve, or more, electronic forms equivalents
for each transaction: invoices, RFPs, shipping notices, bills of
lading, customs forms, change notices, pricing changes, etc.
This means that as EDI usage increases in the variously
responsible end-user departments, volume, and vendor revenue, can
grow exponentially.

Exhibit 1 shows INPUT's overall EDI market forecast,
predominantly representing third-party processing and
communications services, plus software and professional
services.

3.3 Market Inhibitors

The primary EDI market inhibitor is related to people: changing a
company's business methods are necessary for successful EDI
implementations, and there is reluctance for such change.

However, there is evidence that action on the functional level is being pre-empted by corporate mandates, with recent RFPs being championed, not by the end-user departments, but by upper financial management interested in cost improvements.

Another inhibitor to the full evolution of EDI is the applications backlog and the need to optimally integrate EDI functions with internal applications. This points to a third-party opportunity to provide such integration through professional services.

Standards have evolved to a comfortable plateau. There is no logical reason to delay adopting EDI due to unsettled standards, however oftimes, logic does not prevail, and this is the case in some user situations.

3.4 Industries Involved

EDI is advancing in the automobile, aerospace, electronics, chemical, grocery, pharmaceutical and transportation industries (among others). The Automotive Industry Action Group, on behalf of its members, is in the forefront of private EDI (i.e. not through a third-party) implementations centered in Detroit.

Private EDI systems are found in most industries, but the trend
is towards open systems using a third-party because of the
importance of cross-industry data exchanges. For example, the
auto industry trades with steel makers, electronics, rubber,
glass, plastic and transportation vendors.

Exhibit 2 shows INPUT's estimated market segment activity now,
and for 1991.

3.5 Vendors Involved

GEISCO appears the most agressive, and INPUT projects that by the
end of 1986, it will achieve market dominance. McDonnell
Douglas, Sterling Software, Control Data and IBM's Information
Network are also important players. Second tier EDI services
include SCM Kleinschmidt, RailLinc, and TranSettlements, all
primarily focused in the transportation segment. Other
participation is expected.

3.6 EDI Market Needs

EXHIBIT 2

EDI SEGMENT FORECASTS

1986-1991

INDUSTRY SEGMENT	%	1986 Value	%	1991 Value
DISCRETE MANUFG.	0.230	11.269	0.170	348.309
TRANSP.	0.190	9.309	0.180	368.797
MEDICAL	0.120	5.879	0.055	112.688
BANKING	0.080	3.920	0.100	204.887
INSURANCE	0.050	2.450	0.040	81.955
SERVICES	0	0	0.020	40.977
RETAIL DIST.	0.120	5.879	0.190	389.286
PROCESS MFG	0.150	7.349	0.210	430.264
FED GOV'T	0.001	0.049	0.008	16.391
STATE/LOC GOV'T	0.001	0.049	0.003	6.147
EDUCATION	0	0	0.001	2.049
OTHER	0.058	2.842	0.024	47.124

Current and potential EDI services have confided they need better network accounting systems to track, and properly bill for EDI services. As the pricing philosophies of these companies vary, a generic accounting system offered by a developer should be flexible enough to adapt to changing marketing practices.

EDI accounting software will presumedly be needed by any future service providers. Of particular interest to Project Unique will be the prospects of Bell Operating Company (BOC) EDI involvement.

This possibility takes two forms:

- The BOCs, when permitted by regulators, or upon receipt of waivers, may develop their own intra-Lata (i.e. local) EDI services.

- The BOCs, upon completion of local packet switching networks (LADTs), may elect to hand-off EDI traffic to other services. It is probable this scenario will first be actualized in Conneticut where Southern New England Telephone's statewide ConnNet interconnects with Tymnet.

One speculative possibility is for local EDI services to evolve, similiar to hobbyist computer community bulliten boards systems (CBBS). Such services will use the local loop for local

electronic trading, with extended area trading gatewayed to national services.

   The major challenge (and opportunity) to localized EDI services will be linkages between retailers and their distributors or suppliers. There is some activity of this nature, particularly in the pharmaceutical area.

3.7 Aerospace EDI

It is known that the major aerospace companies are either involved (i.e. Rockwell) or planning EDI implementations. Subcontractors will be required to demonstrate EDI capabilities in new projects, and it may be presumed that the information service "spin-offs" of the aerospace firms (i.e. McDonnell Douglas ISG, Boeing Computer Services) will be favored vendors to provide such services and systems development. Hughes Aircraft, now a division of General Motors, will likely use EDS. EDS is adapting General Motors' private EDI system to open industry standards.

   It may be that EDS is becoming overextended, opening opportunities for newer participants. However, contention for

professional project staff is an issue which needs to be considered.

Other aerospace IS spin-offs are believed focused on their parent companies. There may be reluctance on the part of other major aerospace companies to use a competitive vendor's services for security reasons, pointing to a potential opportunity for a non-aligned vendor.

Exhibit 3 shows INPUT's forecast for EDI in the aerospace industry, with a break-out for the potential in the western United States. We do caution, however, that the majority of the industry's EDI activity will be captive. Accordingly, the available market is also shown on the exhibit.

3.8 Electronics EDI

IBM's Information Network is providing EDI services for other IBM units, and Hewlett-Packard has a private EDI system for its suppliers, as does Motorola's Semiconductor division (based in Tempe, AZ). As the auto industry trades cross-industry, so does the electronics industry.

The continuing slow-down in this sector may put increasing

EDI MARKET FORECAST
1985-1990
REVISED VERSION 9/86

	1985	1986	1987	1988	1989	1990	1991
...ERAGE	23.900	48.995	102.400	215.039	453.732	961.913	2048.874
...ltiplier	2.050	2.090	2.100	2.110	2.120	2.130	
...GTH RATE		205.000	209.000	210.000	211.000	212.000	avg:
							2.100
...PPER	26.290	55.119	117.759	252.671	544.479	1178.343	2561.093
...OWER	21.510	42.871	87.040	177.407	362.986	745.482	1536.656

...NDUSTRY SEGMENT ...ind specific	%	1986 valu (from mean)	%	1991 Value (from mean)
...SCRETE MANUFG.	0.230	11.269	0.170	348.309
...RANSP.	0.190	9.309	0.180	368.797
...DICAL	0.120	5.879	0.055	112.688
...NKING	0.080	3.920	0.100	204.887
...ISURANCE	0.050	2.450	0.040	81.955
...RVICES	0	0	0.020	40.977
...TAIL DIST.	0.120	5.879	0.190	389.286
...OCESS MFG	0.150	7.349	0.210	430.264
...D GOV'T	0.005	0.245	0.008	16.391
...ATE/LOC GOV'T		0	0.003	6.147
...=EDUC/TRAINING	0	0	0.001	2.049
...btotl	0.945	46.300	0.976	2001.750
...HER	0.055	2.695	0.024	47.124
...TAL (=100%)	1.000		1.000	

Exh 3

| ...market size | | 48.995 | | 2048.874 |

	1986	value -'86	value -'91
...SC MFG	0.230	11.269	348.309
...ltiplier		0.220	0.230
...erospace		2.479	80.111
...stcoast multip		0.400	0.400
...estcoast		0.992	32.044
...SS WC CAPTIVE =65/55%		0.446	14.420(available)
...ltiplier		0.400	0.400
...lectronics		4.508	139.323
...stcoast multip		0.590	0.530
...estcoast		2.659	73.841
...SS WC CAPTIVE =22%		2.074	57.596(available)

price pressures on vendors, with the result being greater impetus to use cost savings measures such as EDI. This becomes somewhat of a "chicken and egg" situation: cost savings are necessary, but volume (and profit) is down, therefore action is restrained.

Exhibit 4 shows INPUT's forecast for EDI activities in the electronics industry, with a break-out for the western portion of the U.S., and the west coast non-captive share also shown. The electronics segment includes: computers, electronics components, telephone, radio and television equipment.

3.9 Western States Represent Opportunity

The western regions of the U.S. are responsible for a majority of the electronics industry and an estimated 40% of the aerospace industry's activities, with Massachusetts, Florida, Dallas responsible for much of the balance, and New Jersey and North Carolina fulfilling their lesser roles.

3.10 An International EDI Opportunity

The most advanced international EDI provider is GEISCO with its
Trade*Express. McDonnell Douglas is in partnership with British
Telecom for a U.K. based service, and Tymnet does have overseas
links. Computer Sciences is expected to introduce an EDI service
with international capabilities, and IBM's Information Network
has linked with IBM Japan, and IBM networks in Europe, the Middle
East and Africa for international applications.

   With the exception of the   IBM InterContinental Service,
currently, international EDI appears to be graviating towards
Europe.

   With the importance of the Pacific Rim being overlooked, and
with the development of value added networks in Japan, there
appears to be major opportunity for EDI services in this region,
for electronics, apparel, automotive and other industries taking
advantage of off-shore manufacturing economies.

3.11 Adding Value to EDI

3.11.1 The EDI Data Base

Clearly the same links used for EDI applications can be used to

access commercial or proprietary data bases. Applications can be presumed for shipping related data (rate, routes, availability) tied to shipping authorization and payment interchanges.

An emerging EDI data base option will be to use EDI traffic to generate a data base for market research and sales management applications.

To date, only one company (Sterling Software) has implemented such as system, using data capture and retrieval software to trace pharmaceuticals internationally through hospitals, and in the case of veterinary medicine, to zip codes. This has special importance in a era of drug recalls and tampering. For veterinary applications, the information has value to track regional and seasonal needs.

The issues to be faced here are software development and data ownership. In the Sterling Software case, cooperation of the trading partners has been secured.

Exhibit 5 shows INPUT's market estimates for on-line data base access by industry segments. EDI related data base access is an embryonic area and it is therefore premature to offer market estimates for the short or mid-term. However it may be assumed that most industries involved in EDI will find such applications valuable once the attendant data ownership and industry cooperation issues are addressed.

3.12 Conclusions

In some ways, EDI resembles on-line transaction processing, however the mode is currently batch, rather than interactive (as OLTP is usually defined). This is subject to change as requirements for real-time systems grow. Implementing first stage EDI is the initial user objective, with enhancements tied into just-in-time, and integrated applications necessary for optimal benefits.

Although the major aerospace and electronics firms will tend to have private EDI systems, there may be opportunity for third-party services to second tier suppliers who are faced with the difficult task of conforming to multiple private standards and transmission schedules. EDS' Supplier Information System has introduced I-Share for small automaker suppliers to electronically communicate with manufacturers, intended for brief, and infrequent scheduling. This may serve as a model for similiar services in other segments.

Chapter 4

CELLULAR RADIO

One of the most dramatic telecommunications developments has been cellular radio. After years of "hype," the promoters are being discounted and a new realism has surfaced. After wildly optimistic forecasts, the cellular market overall is showing respectable growth, with projections exceeding expectations in some areas.

This chapter first reviews the overall telecommunications market as a customer for information services, then analyzes unique cellular subsegment needs and opportunities.

4.1 OVERALL TELECOMMUNICATIONS INFORMATION SERVICES EXPENDITURES

Sales of industry-specific services to the telecommunications industry will total $717 million in 1986 and will grow to $1,929 million in 1991.

4.1.1 Processing Services

Processing services of all forms to the entire segment represent a $414 million market in 1986, growing at an AAGR of 18%, becoming a $960 market by 1991.

Processing Services in the segment takes two principal forms: billing and management.

4.1.1.1 Billing

The FCC has decided to detariff interstate billing and collections effective January 1, 1987. With requests for reconsideration to allow time to determine the appropriate costing methodology, that date may be delayed.

The largest portion of telecommunications billing, that required by AT&T, is not available to independent vendors. AT&T is taking over its own wireline billing services, for which is pays close to $2 Billion per year. This means that with a few exceptions (principally independent, i.e. not former Bell System companies, cellular long distance, and for low usage customers) the local exchange carriers (LECs) which previously provided such

services to AT&T will be examining ways to fill newly available capacity. Some of this will be taken up as telephone companies move users from flat, fixed rates to measured services, increasing billing data records.

As noted, there is an exception with regards to cellular. Equal access for long distance interexchange carriers (IXCs) now applies to the "wireline" (LEC subsidiary) operators. Recently, Auxton Computer announced agreement with AT&T Communications to provide processing services for long distance toll calls placed by cellular users under equal access rules. Services Auxton will provide include toll rating, billing, collections, toll investigations, and customer inquiry services.

4.1.1.2 Management

Two vendors dominate the on-line services market for management systems directed at the telecommunications industry: McDonnell Douglas Communications Industry Systems Company, a part of the parent company's Information Services Group, and Comshare.

Products in this category include industry specific inventory tracking, repair and maintenance controls, personnel scheduling, order processing, marketing and project management. In larger telecommunications companies, these management functions are

increasingly being addressed with specialized turnkey systems, or with software licensed for internal installation.

4.1.2 Turnkey Systems

Turnkey systems comprise one of the largest delivery modes and while there has been considerable activity in this segment, there is evidence of a crowded market. However, there is also evidence that specialist firms in turnkey systems are adapting in the new environment.

   Turnkey systems represent a $235 million 1986 market   , growing at an AAGR of 21%, and are forecast to represent a $606 million market by 1991.

   Turnkey systems being sold into this sector include directory assistance,   toll   positions,   inventory,   provisioning service/repair bureau systems and to support enhanced emergency (E911) services.

4.1.3 Software

As in most industries, software products are the fastest growing delivery mode, totalling $69 million in 1986 and growing to $363

million in 1991, for a 40% average annual growth rate (AAGR). Continuing strong performance of applications software is expected due to new services being developed by market participants associated with ISDN, and for sale to user organizations to plan, and manage, their installations and new service offerings.

4.1.4 Professional Services

Merger and acquisition activity in the telecommunications industry is leading to professional service opportunities as companies seek to consolidate their networks and systems. There is evidence of this consolidation occuring in the cellular market.

4.2 The Cellular Market

Cellular radio is authorized and becoming operational in largest 200 U.S. cities, and the number of systems is growing overseas, particularly in Europe. Cellular, or cellular-like phones are being installed in commuter transportation, on

airlines and in railroads.

According to INPUT estimates based on industry figures, there will be over 500,000 cellular radio users by the end of 1986, growing to approximately 1.5 million by 1991. This market is being driven by lowering costs, and the introduction of pocket and portable cellular radio terminals.

One failing of the cellular radio industry is that it is based on analog, rather than digital, technology. The second generation of cellular operations, estimated to begin implementation in the 1990-1992 timeframe will work correct this deficiency.

One difficulty in smaller markets is the problem of creating a sufficient user base for profitable operations when alternative mobile telephone systems such as Improved Mobile Telephone Services (IMTS), Specialized Mobile Radio (SMR) and trucked configurations have adequate capacity for current demand, often at lower costs. Previously private mobile telephone was limited to internal business uses but are now allowed to interconnect to the public switched telephone network (PSTN).

Considering the high capital investment necessary, it is estimated that a penetration of 1% of an area's population within five years is necessary for profitable cellular operations. In locales with two operators (i.e. wireline and non-wireline), the

number is proportionally increased.

4.3 Cellular Industry Characteristics

Cellular systems are operated by either independent firms or subsidiaries of the LECs. Due to regulatory requirements, and also because of the parent firm's own applications backlog, these subsidiaries will usually use RCS firms or internal systems to handle their billing.

   The cellular industry is characterized by volatile pricing driven by competitive influences, requiring the ability to rapidly change price schedules. There are billing format inconsistencies between the regular telephone system, cellular billing and "roamer" billing which needed to be addressed. Roaming is discussed below.

   Cellular telephones are being installed in taxi cabs and rental cars or trucks. This creates a demand for billing systems supporting this resale function, similiar to the hotel billing operations used by wireline telcos using the HOBIC standards.

4.4 Information Services Needs in Cellular

In addition to billing services, operators need other applications such as traffic pattern analysis, channel usage and equipment efficiency reports. The primary vendors of such services and software are profiled in the appendix to this report.

A recent industry survey found that 24 states regulate cellular radio service, primarily in pricing and tariffs. There is a deregulatory trend, but meantime, as is the case with the LECs, cellular operators must file a variety of reports with state agencies (usually Public Utility Commissions or PUCs). Preparing these reports is obviously eased with automated systems which may be adapted from those used by wireline telcos.

4.4.1 Barriers to Entry

A significant challenge to BOC-affiliated vendors is to secure business with other industry companies who may consider the vendor a rival and therefore may be reluctant to grant the rival access to sensitive financial information. This factor is a

market inhibitor, based on both emotional and business grounds
which does mean opportunity for independent firms, at least near
term.

Partnering with others, as is the case with Project Unique, may
be colored by the affiliation; it is uncertain if such alliances
will be beneficial or deterimental to the parties involved in
marketing to cellular operators. Clearly, having a "laboratory"
in which to develop needed systems is advantageous. The
disadvantages lie primarily in the marketing area.

Opportunistic cellular enterprises should be approached
cautiously. These sometimes speculative participants often
approach business with financial and marketing concerns
overriding information service concerns, creating opportunities
as well as risks. Unproven, new enterprises may fail, and
vendors may be left without an opportunity to benefit from an
ongoing relationship after an expensive sales and development
process. Hopefully, the bills for services rendered will be
paid.

Other emerging areas related to cellular are mobile data
applications for field personnel and other requirements,
radio-based rural telephone systems, proposed mobile satellite
communications services and radio positioning/messaging systems.
One positioning developer plans to use cellular coordination and

control frequencies for a proposed service.

Proposed rural telephone systems may offer niche opportunities for software and systems suppliers. An estimated 1 million homes are currently beyond telephone network services. Cellular-like systems (although digital rather than analog) are being proposed for new installations and as replacement systems for aging installed plant.

4.4.2 Adding Value to Cellular Services

Because cellular is a relatively new development, advanced services are being designed into systems and the terminal equipment itself. These features, such as call forwarding, voice store and forward, and links to paging systems to notify subscribers of incoming calls, are premium priced. Properly billing for these services, and indeed, providing them in the first place, can be a technological challenge.

Other proposed value added features include current charge reports with total costs to date displayed on the cellular unit, integrated call timers and account billings for professionals, location tracking, security reporting with the system programmed to expect a call from a specific location within a certain time frame, and PIN code or magnetic stripe authorizations for

multiple users of a single unit.

Currently, the volume of users suggests that some systems can be adapted from wireline telephone services ("plain old telephone services", or POTS) may adequately support many of these advanced features. However, as volume and new features are introduced, complexity is added. One of the major "value added" areas is in so-called "roaming," the use of the cellular telephone by a subscriber outside the normal service area.

4.4.3 Roaming

The provision of roamer services still requires authorization by the carrier and in some cases registration and establishment of credit using a credit card. Previously, callers were required to use a standard payphone to apply for such authorization, but now are able to secure the necessary clearance through operator "intercept and offer" procedures.   It has been proposed that roamers be able to call a standardized number (611) for service, but this remains to be developed.

Ideally, roamers should be able to send, and receive, without special handling. The electronic serial numbers associated with units, and the automatic number identification (ANI) scheme can be the basis of roaming, with systems at the operators end

handling billing between systems either directly, or through a clearinghouse using a settlements process.

Exhibit — is a schematic showing the steps in billing a cellular customers.

4.4.4 Clearinghouse Initiatives

In June, 1986, Bell Cellular (a subsidiary of Bell Canada), Bell Atlantic Mobile Systems (BAMS), NYNEX Mobile Communications and Sonecor Cellular joined to form the North American Mobile Association with plans to improve inter-system service in the Northeast and to facilitate stolen equipment tracking. The trade group intends to make it eaier for users to travel bertween cities serviced by its memembers, and to develop a "roaming" customer billing clearinghouse.

On September 25, 1986, Bell Atlantic Enterprises and Appex Lunayach Systems Corp. announced agreement to establish a gateway betwween their ceullular roamer positive validation systems to become operational in October. Both companies reportedly developed such systems featuring realtime validation of roamers and on-line exchange of negative file information for deneying service to unauthorized or fraudlent users. The gateway wwillo be for wireline and non-wireline roaming on A and B systems

FIGURE 1 CELLULAR MOBILE TELEPHONE CUSTOMER BILLING

ANTENNA

CAR RENTAL BILLING SYSTEM

MTSO

THIS SYSTEM WOULD BE USED TO PRODUCE INVOICES FOR CAR RENTAL AGENCIES WHO LEASE MOBILE TELEPHONES WITH THEIR AUTOS THE LAND LINE COS HAVE A SIMILAR SYSTEM (HOBIC) USED FOR BILLING HOTEL GUESTS

AMA MSGS

THIS OUTPUT COULD BE EITHER MAGNETIC TAPE OR A DATA FILE TRANSMITTED DIRECTLY TO THE ACCOUNTING CENTER.

CERTIFICATION DATABASE

THE MOBILE INDUSTRY WILL NEED TO DEVELOP METHODS AND PROCEDURES SIMILAR TO THOSE USED BY LAND LINE COS WHEN A CUSTOMER REPORTS A LOST OR STOLEN CREDIT CARD IF BAD DEBT FROM ROAMERS IS TO BE MINIMIZED

AUTHORIZATION FOR ROAMERS COULD BE A BLANKET AGREEMENT FOR ALL CUSTOMERS FROM A PARTICULAR CELLULAR COMPANY SUPPORTED BY A NEGATIVE FILE FOR SPECIFIC MOBILE SET EXCLUSIONS (KNOWN FRAUD CASES OR COLLECTION PROBLEMS).

LOCAL MOBILE TEL. ACCOUNTING CENTER

INVOICE | BILL | STORE | RATE | EDIT

ROAMER MSGS

THE INDUSTRY STANDARD EXCHANGE MESSAGE RECORD (EMR) WOULD BE USED TO TRANSMIT ROAMER MESSAGES

NATIONAL OR REG. CLEARING HOUSE

THE CLEARINGHOUSE WOULD TRANSPORT ROAMER MESSAGES TO THE PROPER BILLING COMPANY AND CALCULATE BALANCE OF PAYMENTS BETWEEN PARTICIPATING COMPANIES THIS WOULD BE SIMILAR TO THE CENTRALIZED MESSAGE DISTRIBUTION SYSTEM (CMDS) USED BY THE LAND LINE COS TO BILL AND SETTLE FOR NON-SENT PAID MESSAGES.

ROAMER CO. ACCOUNTING CENTER

INVOICE | BILL | STORE | RATE | EDIT

FIGURE 2 ROAMER PHONE NUMBER AUTHORIZATION CHECK PROCESS

SERVICE REQUEST → DOES TEL SERIES CHECK? → YES → NEGATIVE FILE MATCH? → NO → DIAL TONE

NO → DENY ACCESS

YES → DENY ACCESS
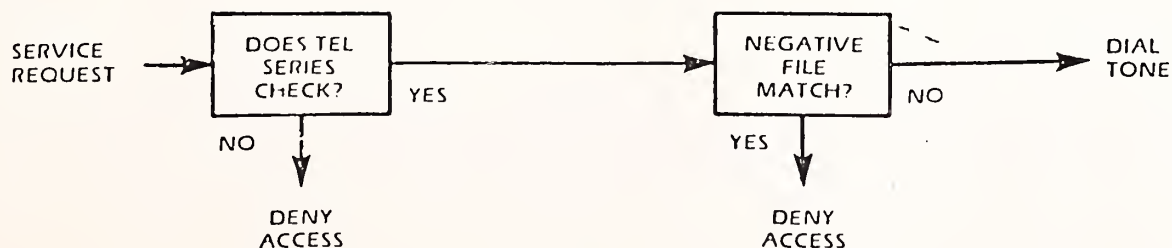
linking major areas of the northeast. INPUT has thus far been unable to find any additional information on Appex Lunayach.

Earlier, Bell Atlantic Enterprises was granted a waiver to provide nationwide roaming clearinghouse services for all wireline and non-wireline carriers. It had been providing such services since August, 1984 to Bell operating companies only. As of February, 1986, the company had nine carriers covering 40 US and nine Canadian markets. The plan is to provide cellular carriers a list of costs accrued by roamers with an account summary noting net charges for settlement. Carriers would be charged on a per message usage basis. The company was also reportedly enhancing a system called Positive Roamer Validation to check a roamer's identity against any other carriers negative file.

In late 1985, Bell Atlantic Mobile Systems announced participating with Cellnet of London to provide international roaming services. ServiceLink will allow customers to contact their home carrier before traveling abroad to reserve portable cellular phones for pick up at their destination airport. The host cellular company then tracks calling charges and daily rental fees for transfer to the home carrier for final billing.

As described in the Appendix, a venture consisting of Cincinnati Bell Informations Systems, its new subsidiary formed

through the acquisition of Cellular Business Systems, Auxton Computer Enterprises and McDonnell Douglas Information Systems have formed a roamer clearinghouse called Advanced Cellular Technologies, Inc.

4.4.5 Cellular Billing Market Size

4.4.5.1 Cellular Billing- 1986

INPUT's proprietary research on the cellular market has found $2.50 a reasonable fee, exclusive of postage, for processing each cellular bill.

Based on 500,000 cellular subscribers, and applying a value of $2.50 to each monthly subscriber bill, INPUT estimates the total value of cellular billing processing to be $15 million in 1986. Approximately 20% of this can be considered "captive", that is, handled by the major cellular operators themselves via turnkey systems or alternatively, through a parent firm's processing facilities. This leaves an estimated available market of $12 million for third parties.

4.4.5.2 Cellular Billing - 1991

Based on an estimated 1.5 million cellular subscribers in 1991,
and a reduction in the value of a bill to $2.00 per month, INPUT
estimates the total value of the billing market at $36 million.
The estimated captive market will increase to 24% leaving an
available market of approximately $27.4 million.

4.4.5.3 Roaming Billing – 1986

It is unclear what price would be acceptable for roamer bill
processing. There may be a per call charge of .20–.50 cents, or
roaming charges may be priced on a monthly, inclusive basis. In
some cases, roamer billing is premium priced, with a per diem
roaming charge levied by operators. However in Chicago, there is
no such add-on.

For this analysis, it is assumed that approximately 9% of the
total cellular billing business can be currently allocated to
roamers. INPUT estimates the value of roaming billing at $1.35
million in 1986.

4.4.5.4 Roaming Billing – 1991

In 1991, it is assumed the amount of roaming will increase to 12%

of the total billing market, creating a forecast $4.32 million opportunity.

Exhibit - shows these findings.

4.4.6 Roaming Conclusions

These numbers suggest that roaming billing by a clearinghouse should be integrated with existing processing, with the goal being a low operations and marketing investment. The potential market size further suggests that the national market will only accomdodate a few clearinghouses.

It should be noted that INPUT's proprietary research on the cellular bill processsing market found nearly half of those surveyed saying it was likely, or highly likely, they would change their billing service. This indicates opportunity for a new vendor who addresses the concerns cellular users have about their current services.

version 10/17

	1986	1987	1988	1989	1990	1991	
REMOTE/BATCH PROC	394.00	473.00	558.00	652.000	766.000	910.00	
cell portion multiplie	0.05					0.07	
cell portion total	19.70million	avoid this				59.15	avoid this
FAC MGMT	20.00	23.00	32.00	37.000	43.000	50.00	
TOTAL APPLIC S/W	68.00	96.00	137.00	191.000	264.000	363.00	
TURNKEY SYS	235.00	279.00	339.00	411.000	497.000	606.00	

TO GET FIGURE, GET PROPORTION OF CELLULAR #S COMPARED TO WIRELINE

TOTAL TEL SUBS	1.3500000E+08	217,418,850.00
CELL SUBS	500,000.00	2,500,000.00
PERCENT =	0.37	1.15

1986 values

				1991 values		
cellular subs – actual	500,000.00	500,000.00	500,000.00	1,500,000.00	1,500,000.00	1,500,000.00
value of bills–each	0.50	1.20	2.50	0.32	1.00	2.00
annually = x 12	6.00	14.40	30.00	3.84	12.00	24.00
value of billing	3,000,000.00	7,200,000.00	15,000,000.00	5,760,000.00	18,000,000.00	36,000,000.00
less captive =x.80/.76	2,400,000.00	5,760,000.00	12,000,000.00	4,377,600.00		27,360,000.00
roaming multiplier	0.09	0.10	0.09	0.12		0.12
roaming billing =	270,000.00	720,000.00	1,350,000.00	691,200.00		4,320,000.00
total x multiplier			USE THIS ONE			USE THIS ONE

(handwritten note:) Write to cell sys per #5

Chapter 5

On-Line Transaction Processing Services

5.1 OLTP Defined

OLTP is usually defined as a large, interactive system using a large, common data base with many users accessing and updating data. They are usually considered in the mainstream of the business rather than for "back office" applications such as accounting.

5.2 The Marketplace

5.2.1 Hardware

OLTP hardware makers such as Tandem, Tolerant, IBM, DEC, Stratus, NCR and others have experienced a reported tripling in U.S. hardware revenues since 1981, to approximately $11-$18 Billion in

1985. The traditional industries using OLTP are becoming saturated, and other industries are being developed.

5.2.2 Industries Using OLTP

Airline, hotel and car rental reservation systems, telemarketing operations, financial services (brokerages, etc), customer services in insurance and field/repair services in other industries, banking ATM and retail POS networks, emergency fire, police and medical dispatch systems, on-line data base information providers and electronic mail services are the leading users of OLTP hardware. In manufacturing, systems for process control, data acquisition, and automated manufacturing are emerging areas.

Of these, the airline market is considered closed, although smaller carriers are implementing downsized internal systems. Banking is also considered saturated, with smaller banks joining networks rather than installing their own ATM or POS services.

The service sector of the general economy is growing at a faster rate than the manufacturing sector and companies are using OLTP to improve customer services and gain competitive advantages.

In manufacturing, OLTP appears oriented to providing "real-time" information on the manufacturing process, and as such, is linked to JIT and EDI initiatives. One utility-oriented company identified in INPUT's literature search has adapted OLTP for pipeline control, monitoring for leaks and security breaches. This, and manufacturing examples, take advantage of OLTP's real-time (versus batch) capabilities and is not truely oriented to transactions, per se.

5.3 Companies Providing OLTP Services

As opposed to hardware solutions, several vendors provide OLTP services. Examples include the Official Airlines Guide (OAG) commercial data base which not only delivers information, but also handles ticketing through a travel agent. Telemarketing response centers operated by several companies (such as American Express, Encyclopedia Americana, others) provide services on an incoming (i.e. 800 telephone number) and outgoing basis.

Other companies with on-line transaction services include National Data Corporation, First Data Resources and MTech which are profiled in Appendix B.

5.4 Probing Utility Company Transactional Needs

Because of Project Unique's previous experience in the utility industry, and because OLTP implementations in other industries are approaching saturation, INPUT briefly examined potential services for the utility industry. This examination is admitted cursory, but may open some areas worthy of further evaluation. INPUT's 1986 analysis of the utilities industry is currently in progress. Research for the current and 1985 analysis was used to inform these comments.

5.4.1 Major Industry Issues

Most utilities have completed major capital projects, financed during inflationary, high interest rate periods. Now, excess capacity, lower consumer demands and high debt servicing have place utilities into major cost reduction programs.

Basic commercial applications need upgrading, and new billing and payment systems based on new technologies need development. Upgrading obsolete systems while containing costs has become the challenge.

In this sector IS largely does its own applications development (81%) although packages are purchased when they do the needed job. New applications are being developed for materials

management, property and capital management, service and
maintenance systems, finance and customer billing.

5.4.2 New IS Roles

Mostly, utility management's view IS as a technical, rather than
a business, asset, but there is evidence management is beginning
to see IS more as a strategic tool. Increasing IS departmental
responsibilities are leading to a higher organizational reporting
role than in the past, and IS is being perceived as a business
solution consultant to the organization.

To help mitigate cost pressures on utilities, IS services are
being examined as possible revenue sources. Services presented
in this role include systems sales to customers, and fee-based
consulting. Large utilities maintain large computer facilities,
often with excess capacity and several provide computing services
to smaller utilities. This role may be expanded to other
industry segments, or to large customers, and could include
network services since major utilities operate their own
telecommunications systems and maintain rights-of-way suitable
for such uses.

One respondent to the 1986 research effort noted that
utilities, and IS, need to become more sales and marketing
oriented. One company reports venture capital and research units

showing enterprising initiative.

5.4.3 Services Versus Systems Needs

While there may be opportunities for transactional services sold to utilities, these are believed limited. Examples include EDI for buying fuels and materials, or for coordinating the efforts of utility cooperatives.   Another example would be a customer credit worthiness data base for relocating consumers; however the needed information is already available from generalized commercial credit bureaus.

   Conceivably, usage data may have value in identifying both consumer and business prospects for energy conservation methods and materials.   Usage data may also be useful in identifying potential cogeneration sites.   However current utility capacity exceeds demand making cogeneration less than a major utility concern.

5.4.4 A Difficult Call

Accordingly, it is difficult to identify utility company needs for a transaction service, but progressive, marketing oriented companies may require on-line transaction systems beyond systems currently used for network monitoring and control.

5.5 Medical On-Line Transaction Services

There would appear needs in the health care segments associated with medical insurance. Shared Medical Systems offers a distributed processing service with computers placed on the customer's premises, linked to SMS' data center for advanced applications, data bases and monitoring, with gateways to governmental agencies (such as Medicare), insurers (such as health maintainence organizations) and suppliers (for EDI applications).

Links to insurers are used for chargebacks, insurance reimbursement claims, and to verify coverage. Some of these services are provided through an industry association's "clearinghouse" or by GEISCO's value added network using the same systems as the industry association.

In the general insurance area, the Insurance Value Added Network (IVAN) operated on IBM's Information Network has not yet been profitable.

New vendor penetration of the healthcare transactions market may be difficult due to the presense of long-time participants including SMS, McDonnell Douglas, GEISCO and several medical

turnkey system vendors. Accordingly, INPUT recommends against
it.

Chapter 6

RECOMMENDATIONS AND CONCLUSIONS

6.1 Refined Information Required

This first stage research project has pointed to potential
opportunities in several areas: aerospace, electronics, cellular
radio and utilities.

Two approaches for further understanding of these opportunities
may be taken:

1. Pilot projects.   Regional   services may be introduced for
    target industries   serving   as   developmental   projects for
    later wider deployment.   Such   projects may   be   jointly
    developed with major users.

2. Additional research. Project Unique may commission, or do
    its own, in depth research with users in targetted
    industries to address unanswered questions and to refine
    approaches to services, or alternately, needed systems.
    Such a project will serve not only data collection, but to

identify prospects for planned services and systems.

6.2 Specific Recommendations

6.2.1 EDI

Project Unique should consider implementing a third-party EDI service for aerospace and/or electronics firms in the western U.S. to supplement existing private EDI systems. Since one of the partners operates with some regulatory restraints, waivers will probably be required.

EDS' I-Share Supplier Information System, operated for small suppliers to the auto industry may serve as a proper model for such services.

With regards to the electronics subsegment, international (i.e. Pacific Rim) services should be explored with companies doing business with off-shore suppliers. Further, partnering with, or links to. emerging Japanese Value Added Networks should be investigated.

6.2.2 Cellular Clearinghouse

While there would appear to be a need for multiple cellular roaming clearinghouses similiar to regional bank check clearinghouses, the forecast market size for billing services suggests caution and the need for both a realistic approach, and realistic expectations.

While Bell Atlantic's and Advanced Cellular Technologies' clearinghouses are intended as national services, their spheres of influence are likely limited by geography for marketing and support reasons. A clearinghouse, developed by Project Unique partners in a timely fashion, could find modest success in the western states, including Hawaii and Alaska.

It may be presumed that most roamers will require services on a regional, rather than national, basis. However for those requiring national services, links between clearinghouses may be necessary. INPUT recommends that clearinghouse exchanges be investigated after a western region service is established, and that procedures be developed for cooperative activities.

Therefore, INPUT recommends Project Unique develop a regional clearinghouse, using its own affiliated cellular systems as development and test sites, then identify competitors' weaknesses in marketing, service and pricing to develop its own strategic position. Newly installed cellular systems are the best user

targets, and dissatisfied users of existing clearinghouses may be "churned" to the new service. As the research indicates, approximately half of the surveyed users of cellular billing services are inclined to sign with new providers.

However, the cautions and risks discussed in this report (particularly the market size) must be acknowledged.

It may be useful to reiterate INPUT's recommendations for vendors considering service and systems development in the general telecommunications market.

- Recognition be made of the long lead times and planning cycles characteristic of many operations, leading to long sales cycles, particularly in regulated segments. This sluggishness, a holdover from the regulated environment, also means prospective competition from BOC subsidiaries may be developmentally hindered.

- Vendors be aware of the fact that needed systems are often massively complex and interrelated, a fact that can heavily influence service or software design. Given the forecast market size for cellular clearinghouses, the breakeven point will be years away.

- Vendors recognize that the levels of automation can be significantly different among entities, related to specific

segment, prospect size, location, culture and requirements.

- Vendors examine ways of adapting software, systems and services to large telecommunications users who are operating and managing their own facilities, and for international (particularly developing) markets where telecommunications infrastructures are being developed.

6.2.3 Utility Company OLTP

INPUT is unable to recommend a clear service opportunity in this area, nor in other industries needing on-line transactions. The reasons are:

- Saturated markets.

- Internal solutions based on fault-tolerant hardware.

- The difficulty of selling innovative services into the utility segment.

The possibilities for innovative systems for the utility industry (rather than services) as identified in this report may be worthy of further investigation with progressive utility firms.

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Appendix A

CELLULAR INFORMATION SERVICES COMPETITIVE PLAYERS

This appendix profiles the leading vendors providing processing services, professional services, software and turnkey systems to the cellular segment of the telecommunications industry.

Several major companies have been excluded from this report because they do not provide clearly identified cellular-related offerings. INPUT believes many of these companies, including BOC affiliates, have cellular capabilities, and in fact their offerings are adaptable to the cellular submarket.

A.1 Advanced Cellular Technologies, Inc. (ACTI)

ACTI, headquartered in Creve Coevr (MO) was formed as a cellular radio clearinghouse, designed to authorize and process billing for cellular roamers, users making calls outside their home system. The newly formed company is a joint venture of

Auxton Computers, Cincinnatti Bell Information Systems, Cellular Business Systems, Inc. (recently purchased by CBIS), and McDonnell Douglas Information Systems Group.

A.2 AT&T Network Systems

This group is responsible for the design, manufacture, marketing, engineering and installation of telecommunications networking equipment, much of which incorporates software.

Major customers include Regional Bell Operating Companies, AT&T Communications, independent telcos, non-Bell cellular telephone companies and other common carriers, both domestic and international.

AT&T Network Systems provide systems supporting cellular operations under the Autoplex trademark. Included is a privacy/data encryption product, a cellular operator position and cellular analysis tools (for balancing power thresholds with traffic patterns, fault isolation, supported with a diagnostic center.

A.3 Auxton Computer Enterprises Company (AUXCO)

AUXCO (Maitland, Florida), formed in 1969, specializes in services and systems for the telecommunications industry.

In addition to management consulting and customized software, the firm offers processing services for long distance carriers, resellers, cellular operators and paging services.

- Compu-Network provides calculation of service charges, billing, adjustments and customer records maintenance, as well as payment processing and collections, with credit information integrated into the customer database. Volume or percentage discounts can be calculated if offered.

- Compu-Cellular handles similiar functions, and includes order processing, repair tracking and inventory management and can provide market analysis information.

The company is also developing software for a planned cellular clearinghouse for roaming applications and is participating with Cincinnati Bell Information Systems and others in forming such a clearinghouse.

In late 1986, Auxco announced agreement with AT&T Communications to provide processing services for long distance toll calls placed by cellular users under equal access rules. Services covered include toll rating, billing, collections, toll investigations, and customer inquiry services.

Auxco software available for a customer's IBM processors covers a wide range of wireline telephone operations.

The company is processing for 14 cellular companies, including the subsidiaries of Bell South, Southwestern Bell, Contel, Pacific Telesis, United Telecommunications, and others representing 34 systems. The company claims nearly half of the wireline cellular processing business.

Other clients include long distance resellers for billing and processing services.

The company sees its cellular expertise as a principal strength along with service and product quality.

The company reported 1985 revenues of $28 million, with 65% derived from professional services consulting, 23% from processing services and 12% from application software products sold to the telecommunications industry. It employes approximately 385.

Revenues for the three months ending March 31, 1986 were $7.7

million, a 19% increase over the same quarter in 1985.

A.4 Bank of Illinois

The Champaign (IL) bank operates a data center which provides processing services to telecommunications and other entities.

Regional independent telephone companies and approximately cellular operators currently use its billing and other services.

The Bank sees its major competitive strengths as its stability. Backed by a financial institution, it's able to expand without needing external resources. It also competes based on price and service. For example, bank personnel work with cellular marketing departments to provide insight into the requirements for data processing due to service pricing changes to provide ample time for the necessary programming changes.

A.5 Bell Atlantic

Units of this company have been active in developing cellular

roamer clearinghouse systems, as reported in the text of the report.

A.6 Cincinnati Bell Information Systems, Inc. (CBIS)

CBIS (Cincinnati, O.) provides telecommunications software and services to BOCs, independents and offshore telecom companies for billing and outside plant management, and has ventured into processing services with a cellular radio offering.

Cellware, an integrated cellular message processing, account management and customer billing system for cellular operators and resellers which rates calls and supports other online features

CBIS has acquired several entities to bolster its service and software offerings. Cellular Business Systems Inc. (CBSI - Park Ridge, Il.) was acquired in 1986 as a division of CBIS.

- CBSI's professional and processing services and software support a variety of industry specific applications such as customer database and telephone number management, call rating and billing, charge reconciliation, and billing for

car rental cellular services.

- The combined companies provide billing services in most of
  the top 30 cellular markets, billing in excess of 200,000
  cellular users.

- CBIS, its new CBSI division, Auxton Computer and McDonnell
  Douglas Information Systems Group have formed a cellular
  clearinghouse headquarted in Creve Coeur (MO) called
  Advanced Cellular Technologies, Inc.

A.7 McDonnell Douglas Communications Industry Systems
    Company (MDCISC)

In addition to a wide variety of processing services offered to
wireline telecommunications companies, McDonnell Douglas is
participating with Cincinatti Bell Information Systems and Auxton
Computer to develop a cellular telephone clearinghouse.

MDCISC is the largest processor for the industry outside the
former Bell system, with all 22 BOCs, the RBOCs and AT&T as
customers, as well as the major independents.

A.8 TDS Computer Services

TDS, based in Madison, WI is a wholly owned subsidiary of Telephone and Data Systems (TDS), a telephone operating group.

The company primarily services TDS companies including 70 telcos, 16 CATV firms, paging and mobile telephone companies throughout the midwest and eastern states.

TDS Computer Services claims annual revenues of approximately $7 million.

A.9 OTHERS

Smaller firms selling to the cellular, and related submarkets are:

- Celltech Inc. (Houston, TX) which sells a billing and account system for cellular, mobile radio, and paging companies, and for long distance resellers.

- Commonwealth Communications (Wilkes-Barre, PA) offering a cellular billing service bureau and an internal system for

account management and bill generation.

-   Communications Software, Inc. (Atlanta, GA) providing
    turnkey systems for radio common carriers, telephone
    answering services and mobile radio comanies.

-   In-Touch Management systems (Elmont, NY) providing a
    management system for radio common carriers and telephone
    answering services.

-   Mid-America Computer Corporation (MACC) (Blair, NE),
    providing billing services and selling a turnkey system.
    MACC is the national data administrator/billing center for
    the Air-Ground Radio Automated System (AGRAS) which provides
    dial-up telephone service to general aviation (private)
    pilots.

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Appendix B

PROFILES OF COMPANIES INVOLVED IN TRANSACTIONAL SERVICES

COMPANY PROFILE

FIRST DATA RESOURCES, INC.
10805 South Old Mill Road
Omaha, NE 68154
(402) 399-7000

P. E. Esping, Chairman and CEO
Robert E. Masterson, President
Public Corporation, OTC
Total Employees: 6,700
Total Revenue, Fiscal Year End:
  1984: $203,001,000
Computer Services Revenue:
  $182,700,000*

THE COMPANY

- First Data Resources Inc., founded in 1971, is the nation's largest third-party data processor of debit and credit card transactions, providing on-line data base information services to more than 650 banks across the U.S. The company also provides processing services for telemarketing, cash management, cable television, airline reservations, and nine-digit ZIP code addressing. During 1983, First Data expanded its services to include third-party hardware maintenance.

- In 1980 American Express Company purchased 80% of the capital stock of First Data for approximately $50 million and the remaining 20% was acquired over the next three years for an additional $30 million.

  - In 1983 American Express transferred all of its First Data shares and rights to American Express Travel Related Services Company (TRS Co.), a wholly owned subsidiary of American Express.

  - In June 1983 First Data was recapitalized and an amendment was adopted authorizing 65 million shares of common stock, 20 million shares of Class A stock, 3 million shares of Class B stock, and converting and exchanging the former capital stock to 18,760,000 shares of Class A stock.

  - During 1983 First Data paid TRS Co. a $58 million dividend, sold 2,240,000 shares of Class B stock to 34 key employees, and sold 4 million shares of common stock in an initial public offering for $56 million. Proceedings from Class B and common stock sales were used to repay debt incurred to pay the $58 million dividend to TRS Co.

  - As of December 31, 1984, TRS Co. owned 100% of First Data's outstanding Class A stock, representing approximately 75% of the company's capital stock and approximately 96% of the voting power.

*INPUT estimate

INPUT

FIRST DATA RESOURCES, INC.

- 1984 revenue reached $203 million, a 37% increase over 1983 revenue of $148.6 million. Net income rose 31%, from $20.6 million in 1983 to $27 million in 1984. A five-year financial summary follows:

FIRST DATA RESOURCES INC.
FIVE-YEAR FINANCIAL SUMMARY
($ thousands, except per share data)

ITEM \ FISCAL YEAR	1984	1983	1982	1981	1980
Revenue	$ 203,001	$ 148,564	$ 115,969	$ 83,401	$ 54,470
. Percent increase from previous year	37%	28%	39%	53%	7%
Income before taxes	$ 51,328	$39,169	$ 29,454	$ 23,558	$ N/A
. Percent increase from previous year	31%	33%	25%	N/A	N/A
Net income	$ 27,007	$ 20,613	$ 16,046	$ 12,810	$ 6,137
. Percent increase from previous year	31%	28%	25%	109%	54%
Earnings per share	$ 1.08	$ 0.88	$ 0.71	$ 0.56	$ 0.27
. Percent increase from previous year	23%	24%	27%	107%	80%

- Approximately 35% of the increase in 1984 revenue was attributed to the company's principal product, Transaction Services, mainly through increased credit card transactions brought about by an improved economy. The remainder of the increase was attributed to growth in each of the company's newer product lines.

- Research and development expenditures were approximately $6 million (3% of revenue) in 1984, $5 million (3% of revenue) in 1983, and $3.7 million (3% of revenue) in 1982.

- Acquisitions made by First Data over the past two years include the following:

  - In September 1984 First Data acquired KMP Computer Systems of Los Alamos (NM) for approximately $250,000.

    . KMP provided cable television subscriber billing services for smaller cable companies.

    . KMP had approximately five employees and annual revenue of approximately $600,000 at the time of the acquisition.

INPUT

- On July 3, 1984, First Data acquired the field service operations of ATV Systems, Inc. of Santa Ana (CA) for $8.7 million.

    - ATV develops, manufactures, and markets microprocessor-based point-of-sale and multi-function office information systems.

    - In accordance with the July 1984 agreement, First Data has agreed to perform the repair and maintenance service that ATV was required by contract to provide to purchasers of ATV equipment.

    - The field service operations of ATV had approximately 400 employees at the time of the acquisition and annual revenue of approximately $18 million.

    - Based on an evaluation of the acquired operations, First Data has subsequently recognized a $5.7 million reduction in the value of certain receivables and intangibles and believes it is entitled to a refund of a portion of the purchase price. ATV has filed suit against First Data. The matter is pending.

    - These operations have been merged into FDR Field Service Company, a wholly owned subsidiary of First Data.

- On November 30, 1983, First Data purchased 100% of the issued and outstanding common stock of INDESERV Inc. of Littleton (MA) for $1.6 million in cash to be paid over approximately two years plus additional payments of not more than $2.7 million based on INDESERV's net income during the four-year period beginning January 1, 1984.

    - INDESERV, in operation since 1974, is a network of independent service companies providing nationwide field maintenance of data processing and communications equipment.

    - INDESERV had approximately $2.5 million in revenue at the time of the acquisition.

    - INDESERV now operates as a wholly owned subsidiary of First Data as part of FDR Field Service Company.

- Revenue for the three months ending March 31, 1985 was $63.4 million, a 52% increase over $41.8 million for the same period in 1984. Net income rose 41%, from $6.6 million to $9.3 million.

- First Data is currently organized into seven business areas as follows:

    - Transaction Services provides a range of services for the management and automation of debit and credit card activities, including cardholder and merchant account services, credit authorization, embossing, and security services.

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- Telemarketing Services provides business customers a nationwide telephone marketing and information service via WATS Marketing of America, Inc.

- Cable System Services provides data collection and reporting services for cable television franchise operators.

- Cash Management Services provides cash and information reporting services primarily for customers with operations at remote locations.

- Transportation System Services provides telephone reservation processing services for People Express Airlines.

- Government Services provides nine-digit ZIP Code data for the U.S. Postal Service and updating of mail lists for commercial customers, as well as Medicaid authorization services.

- FDR Field Services Company provides maintenance services from 60 offices nationwide serving nearly 9,000 customer locations.

- PLANUS, formed in 1984 as a division of FDR Field Services Company, provides personal computer maintenance services through its retail stores located in Omaha (NE), Burlington (MA), and Costa Mesa (CA).

• First Data currently has approximately 6,700 full- and part-time employees. Of these, approximately 4,600 are located in Omaha and are segmented as follows:

Marketing/sales	250
Customer support	3,400
Research and development/ computer operations	420
Field service	380
General and administrative	150
	4,600

- The remaining 2,100 employees are located in branch offices throughout the U.S. to provide marketing, sales, and customer support services.

• First Data's competitors by business segment, include the following:

- Transaction Services: National Data Corporation, NABANCO, and various credit card associations.

- Telemarketing Services: National Data Corporation and NICE Corporation.

- Cable System Services: Cable Data.

INPUT

- Cash Management Services: National Data Corporation.

- Transportation System Services: J. C. Penney.

- Government Services: Electronic Data Systems.

- Field Services: Sorbus and TRW.

KEY PRODUCTS AND SERVICES

- Virtually 100% of First Data's 1984 revenue was derived from processing services. Less than 1% was derived from foreign software licenses for its debit and credit card processing system.

- Approximately 66% of 1984 revenue was derived from Transaction Services, 11% from Telemarketing Services, and 20% from the remaining business segments. Interest income represented 3% of revenue. A two-year summary of source of revenue, as estimated by INPUT, follows ($ millions):

	1984		1983	
	Revenue	Percent of Total	Revenue	Percent of Total
Transaction Services	$134.0	66%	$118.7	80%
Telemarketing Services	21.7	11	19.0	13
Cable System Services	8.5	4	4.1	3
Cash Management Services	4.5	2	2.5	2
Transportation System Services	5.5	3	-	-
Government Services	8.5	4	1.5	-
Field Services	15.0	7	0.1	-
Interest	5.3	3	2.8	2
Total	$203.0	100%	$148.6	100%

- Transaction Services provides services associated with credit and debit card processing, including cardholder and merchant accounting, credit authorization, embossing, and security services.

    - First Data generally contracts to provide card-related services to its customers for initial terms of four years, with optional renewals by the customers for two years thereafter. These agreements fix various price schedules for the initial term and, depending on the particular services required, may incorporate the passing on to the customer of specified increased operating costs, yearly price increases, and minimum yearly aggregate transaction fees.

    - The services are marketed primarily to financial institutions that issue MasterCard and VISA cards and to bankcard associations composed of

INPUT

banks that have joined together to facilitate entry into the card market. Transaction services are also provided to airlines and, through banks, to retailers that issue credit cards.

- As of December 31, 1984, the company had service agreements with over 630 banks and four bankcard associations. First Data currently has service agreements with over 650 banks and six associations representing over 100 banks. Association clients include the New England Bankcard Association (NEBA) in Boston, the Southeast Bankcard Association (SEBA) in Atlanta, Mid-America Bankcard Association (MABA) in Omaha, the Mountain States Bankcard Association (MSBA) in Denver, the Western States Bankcard Association (WSBA) in San Francisco, and the Bankcard Association of Rhode Island (BARI) in Providence.

- Through agency relationships between banks, First Data provides services to approximately 3,000 additional financial institutions.

- First Data has contracts with United, Western, and PSA Airlines for airline credit card processing services. Oil company clients include Kerr-McGee.

- Card processing services include data collection and entry, credit card billing, merchant accounting, and statement preparation and mailling. During 1984 First Data processed approximately 503 million card transactions and serviced more than 22 million accounts for its customers, compared to 445 million card transactions and services for more than 19 million accounts during 1983.

  - Debit and credit card transaction records are deposited by merchants in banks and forwarded to one of First Data's branches in Omaha, Boston, Atlanta, or San Mateo (CA) for data entry and balancing.

  - The information is posted to the cardholder account (if maintained by First Data) or (if the account is not maintained by First Data) is transmitted electronically through the VISA or MasterCard network to the bank which maintains the cardholder account.

  - Cardholder transactions are also posted daily to accounts maintained by First Data with data received through the VISA and MasterCard network.

  - First Data prepares daily financial settlements for its customers and provides general ledger accounting input to each customer's accounting system.

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- Updated account information is available daily both on-line through remote terminals and through hard copy.

- First Data's authorization services provide banks and merchants with an on-line credit authorization network for MasterCard and VISA cards. During 1984 the company handled more than 91 million authorization inquiries, a 40% increase over the 65 million in 1983. Authorization services are provided through voice, audio response, terminals, and electronic cash registers.

  - Approximately 40% of the inquiries are handled by voice authorization through centers in Omaha, Boston, and Los Angeles that are staffed 24 hours a day, seven days a week. Merchants throughout the U.S. access these centers via WATS telephone lines. Voice authorization fees generally range from $0.60 to $0.70 per inquiry.

  - Approximately 20-30% of the inquiries are handled by audio response. Merchants enter their inquiries via a touch-touch telephone and receive a computer synthesized speech response from First Data's Omaha data center. Audio response fees generally range from $0.25 to $0.50 per inquiry.

  - Point-of-sale authorizations are available through terminals that access First Data's Omaha data center via leased lines or direct-dial. Fees range from $0.10 to $0.25 per inquiry.

  - CPU to CPU authorizations involve inquiries initiated at the merchant's electronic cash registers, through the merchant's computer to First Data's Omaha data center via leased lines. These authorization services are currently provided to over 50 clients nationwide. Fees generally range from $0.05 to $0.08 per inquiry.

- Card Services provides for the storing, embossing, and mailing of various types of plastic cards for a variety of industries.

  - During 1984 over 24 million cards were embossed and encoded (a 29% increase over 1983) including MasterCard and VISA cards, automated teller machine cards, debit cards, and plastic cards for direct marketing solicitation programs.

  - First Data was involved in the development of the laser-imaged micrographic health care card marketed under the name QuiKare by a large midwestern hospital. The card carries personalized medical history information.

- Securities Services functions primarily in the area of bank cards, although the services are also provided to customers in other card-issuing industries. Services include:

INPUT

- Receiving and processing notifications from card issuers and cardholders regarding lost or stolen cards. During 1984, 640,000 such phone calls were handled, a 20% increase over 1983.

- Making preliminary investigations of transactions made or attempted with lost or stolen cards.

- Investigating fraudulent transactions via 18 locations nation-wide.

- During 1984 First Data expanded its services to include wholesale check guarantee services on its existing authorization network. Clients include Telecredit and Telecheck (McDonnell Douglas Information Systems Group).

- Telemarketing Services, accounting for nearly 11% of 1984 revenue, provides telephone marketing services through WATS Marketing of America, Inc., a wholly owned subsidiary. WATS Marketing was acquired by First Data in 1980.

  - The 1984 volume of transactions was 14.5 million, compared to 12.4 million in 1983.

  - Using toll-free telephone lines, WATS marketing provides "inbound" and "outbound" services.

    - Inbound services involve the receipt, on behalf of WATS Marketing customers, of telephone inquiries and merchandise orders from consumers responding to television commercials, printed advertising, direct mail, catalog offerings, and other marketing campaigns conducted by those customers. Inbound production capacity was increased by about 50% during 1984. Up to 250,000 incoming one-minute phone calls a day, seven days a week, can be processed.

    - Outbound services involve calls by WATS Marketing operators, on behalf of business customers, to generate and verify sales, raise funds, conduct market research, renew subscriptions, and conduct other merchandising programs. During 1984 as many as two million outbound calls were generated for a single client. Outbound production capacity doubled during 1984.

  - Inbound services are handled in Omaha. Outbound services are provided through Omaha and Lincoln (NE).

  - Clients include AT&T, R. J. Ryenolds Tobacco Company, and Proctor & Gamble.

  - First Data Management expects Telemarketing Services to grow approximately 25% during 1985.

INPUT

- Cable System Services, accounting for 4% of 1984 revenue, provides cable television management information and subscriber billing processing services and subscriber billing software for microcomputers.

  - During 1984 services were provided to more than 150 cable systems representing more than 2.5 million subscribers, compared to cable systems representing 1.5 million subscribers in 1983.

  - First Data usually enters into written agreements with its cable television system customers for initial periods of two or three years, with optional renewal periods selected by the customer for periods of at least six months and as long as three years.

  - Processing services include:

    - Subscriber billing through cycle management, with descriptive statements that include individual itemizations and pay-per-view breakdowns by date and time.

    - Centralized payment processing.

    - On-line subscriber inquiry, including collection data.

    - On-line data base management, including work order monitoring, scheduling, and dispatching fucntions.

    - Consolidated management reporting for financial, operational, and sales/marketing control.

  - Clients include cable systems ranging in size from 1,000 to 180,000 customers, as well as Multiple System Operators (MSOs). MSO clients include Group W Cable, Warner Amex Cable Communications, Tele-Communications, Inc., Cox Cable Communications, Continental Cablevision, and American Cablesystems.

  - With the acquisition of KMP Computer Systems in 1984, First Data has expanded its offerings to incude subscriber billing software for microcomputers under the name "Micro Delivery Option" and "Cablestar."

    - The products are targeted to cable systems with 200 to 20,000 subscribers.

    - The software runs on IBM microcomputers and ranges in price from $2,500 to $30,000.

    - Features include billing and information management.

- Cash Management Services, generating an estimated 2% of 1984 revenue, provides cash concentration services under the name CashData™ for organizations with multiple locations.

INPUT

- More than six million transactions were handled in 1984, a 50% increase over 1983.

- Cash management services are marketed both to banks (which incorporate First Data's services as a part of the bank's overall service) and directly to large corporations.

- First Data generally contracts to provide these services for initial terms of one year with optional renewal terms of one year.

- Cash control features include the following:

  . Local branch managers report their daily local bank deposits and operating statistics to First Data via a toll-free telephone number.

  . First Data accumulates the reported amounts from the various branches and reports the aggregate to the client's designated concentration bank, permitting the customer to consolidate funds via wire transfer for overnight investing.

  . In 1984 First Data introduced an Audio Response Service permitting customers to report deposit data using a touch-tone telephone.

- Information reporting features include the following:

  . Prior day reports and detailed activity documentation.

  . Sales and operating data, balance and inventory reports, and accounts payable and receivable.

  . Customized reports by specific operation, area, and type of customer, as well as other variables.

- First Data management states that its Cash Management Services are growing 40% to 50% a year.

• Transportation System Services, established during 1984, generated an estimated 3% of 1984 revenue. This group provides telephone airline reservation services for People Airlines, Inc.

  - Facilities in Omaha and Jacksonville receive telephone requests from individuals and travel agencies regarding arrival and departure times for flights scheduled by People Express, the costs of such flights, seat availability, and reservations. Operators respond to the requests by accessing People Express' on-line reservation system in Newark (NJ).

  - There are currently over 465 reservation operator positions in Omaha and approximately 350 positions in Jacksonville.

INPUT

FIRST DATA RESOURCES, INC.

- Government Services, contributing an estimated 4% to 1984 revenue, primarily provides nine-digit ZIP Code (ZIP+4) information to the public through a contract with the U.S. Postal Service.

    - The volume of ZIP+4 transactions in 1984 was 24.9 million, compared to 4 million in 1983. Inquiries are expected to reach 60 million in 1985.

    - First Data provides ZIP+4 information via toll-free telephone lines to the U.S. Postal Service and private mailers.

    - During 1984 First Data installed terminals at 120 postal sites to provide 24-hour on-line access to the central ZIP+4 directory in Omaha which contains over 23 million addresses. This network is expected to expand to 200 sites in 1985.

    - First Data also provides commercial customers with mail list updating services, including conversion to ZIP+4, address corrections, and standardization of format and style to U.S. Postal Service guidelines.

    - First Data plans to expand its services to other governmental agencies at the federal and state level.

        - First Data is currently working with several states to produce an on-line computerized verification system to reduce Medicaid fraud using its card processing and on-line authorization capabilities.

        - Other government activities involving other card-based large-volume transactions are also being researched.

- Hardware maintenance services, contributing an estimated 7% of 1984 revenue, are provided as follows:

    - FDR Field Service Company provides on-site maintenance services nationwide and includes the operations of INDESERV and ATV Service Corporation.

    - PLANUS operates three retail stores from which it sells personal computer maintenance (depot repair) service agreements to individuals and businesses.

INDUSTRY MARKETS

- Approximately 60% of First Data's 1984 revenue was derived from the banking and finance industry and 20% from the retail industry. The remaining 20% was derived from large corporations, the federal government, cable television companies, direct mailers, the medical industry, People Express Airlines, and various businesses whose computers and peripherals are maintained by First Data.

INPUT

GEOGRAPHIC MARKETS

- One hundred percent of First Data's 1984 revenue was derived from the U.S.

- Branch offices are located in Atlanta, Boston, Los Angeles, and San Mateo (CA).

- Field maintenance services are provided from 60 locations nationwide. PLANUS retail stores are located in Omaha, Burlington (MA), and Costa Mesa (CA).

COMPUTER HARDWARE AND SOFTWARE

- First Data has a NAS AS/9080 and a NAS AS/90000-DPC, operating under MVS/SP installed at its data center in Omaha.

  - The company uses approximately 10,000 terminals, of which approximately 1,800 are remote terminals located in branch offices.

  - Approximately 37 IBM Series minicomputers are used at branch offices and at the data center to collect data and transfer it to the NAS mainframes.

- Clients may access First Data's services via WATS lines, leased lines, FDRnet (First Data's proprietary network), TYMNET, or Telenet.

  - WATS lines are used to access voice authorization centers in Omaha, Boston, and Los Angeles, airline reservation centers in Omaha and Jacksonville, cash management services, and inbound telemarketing services in Omaha.

  - Leased lines are used for point-of-sale authorization services, cable services, and all bank credit card customers and the U.S. Post Offices.

  - FDRnet is used to access point-of-sale systems and authorization services.

  - TYMNET and Telenet are used by clients to access bankcard systems.

INPUT

COMPANY PROFILE

MTECH
1712 Commerce Street
P.O. Box 660666
Dallas, TX 75266
(214) 742-7100

Darwin Deason, Chairman and CEO
Subsidiary of MCorp
Total Employees: 2,600
Total Revenue, Fiscal Year End
12/31/85: $165,100,000
Total Noncaptive Computer Services
Revenue: $99,900,000

THE COMPANY

- MTech provides processing services, software products, and professional services primarily to the banking and finance industry. MTech is the developer and operator of MPACT, an automatic teller machine (ATM) network, and MPACT EXPRESS, a point of sale (POS) network marketed to the retail industry.

  - MTech was founded in 1968 as Affiliated Computer Systems (ACS), a private corporation that provided processing services to commercial banks. In 1975 ACS was acquired by Mercantile Texas Corporation, a bank holding company, for $2.5 million. ACS subsequently expanded its products and services to commercial and thrift financial institutions, including savings and loans, mutual savings banks, and credit unions.

  - On October 10, 1984 MCorp was formed as a result of a merger of Mercantile Texas Corporation and Southwest Bancshares, Inc. and ACS was renamed MTech.

- MTech's 1985 total revenue reached $165.1 million, a 42% increase over 1984 revenue of $116.5 million. A four-year financial summary follows:

INPUT

MTECH
FOUR-YEAR FINANCIAL SUMMARY
($ millions)

FISCAL YEAR / ITEM	1985	1984	1983	1982
Total revenue	$165.1	$116.5	$83.3	$54.8
. Percent increase from previous year	42%	40%	52%	54%
Income before taxes	$ 10.4	$ 9.9	$ 5.1	$ 2.4
. Percent increase from previous year	5%	94%	113%	267%
Net income	$ 5.6	$ 7.0	$ 3.3	$ 2.0
. Percent increase (decrease) from previous year	(20%)	112%	65%	243%

- Recent acquisitions made by MTech include the following:

  - Effective December 1985, MTech acquired Ohio Valley Data Control, Inc. of Belpre (OH).

    . Ohio Valley Data Control provided processing services to financial institutions in West Virginia and Ohio.

    . Ohio Valley Data Control now operates as MTech Ohio Valley in Ohio and MTech Kanawha Valley in West Virginia within the Financial Services Division of MTech.

  - Effective September 1985, MTech acquired Network Consultants, Inc. of Chicago (IL) from General Electric.

    . Network Consultants provided wire-transfer and cash management software products to the banking industry.

    . The company had approximately 50 employees at the time of acquisition.

    . Network Consultants now operates as MTech NCI within the Electronic Banking Division of MTech.

  - Effective September 1985, MTech acquired First Chicago Data Corporation of Chicago from First Chicago Corporation.

    . First Chicago Data provided processing services to the financial industry in the Chicago area.

INPUT

- The company now operates as MTech Midwest within the Financial Services Division of MTech.

- In March 1985 MTech acquired the Electronic Banking Systems (EBS) Division of Docutel/Olivetti Corporation. Terms of the acquisition were not disclosed.

  - EBS provides financial institutions with facilities management services for the development, establishment, operation, and funding of neutral shared off-premise ATM networks.

  - EBS had approximately 20 employees at the time of the acquisition.

  - The operations of EBS have been merged with MTech's Electronic Banking Division.

- In November 1984 MTech acquired Data Information Services, Inc. (DIS) of Dallas (TX).

  - DIS provides consulting and training to the banking and finance industry and has approximately four employees. The acquisition was accounted for as a purchase.

  - DIS has been renamed MTech/DIS and now operates as a wholly owned subsidiary of MTech.

- On June 8, 1984, the company acquired the Financial Services Division of Datatel, Inc. (now known as MTech Mid-Atlantic) with centers located in Alexandria (VA) and Bluefield and Clarksburg (WV). There are currently over 80 employees.

- On April 18, 1984, MTech acquired Savings Management Computer Corporation, located in Boston, which provides processing services to savings banks. It was renamed MTech New England and has over 80 employees.

- In March 1984 Thunderbird Automation Group, Inc. of Tulsa (OK) was acquired.

  - The company develops and markets microcomputer software for financial institution information management. It had approximately 10 employees at the time of the acquisition.

  - Thunderbird Automation now operates as MTech Micro Services, a division within the Financial Services Division.

- In addition to the companies mentioned above, during the past two years MTech has assumed facilities management of the data centers of three banks. Subsequent to these acquisitions, the banks have generally become MTech processing clients.

INPUT

MTECH

- MTech management estimates 1986 total revenue will exceed $200 million.

- MTech currently has 43 data centers, subsidiaries, and sales offices in 16 states. The company is organized into three major divisions as follows:

  - The Financial Services Division provides remote computing and associated consulting and educational support services to commercial banks and thrifts. This division also markets IBM microcomputers and microcomputer software.

  - The Electronic Banking Division is responsible for the marketing and operations of MTech's MPACT proprietary ATM network and the MPACT EXPRESS POS network, as well as switching relationships with other networks. This division also markets and supports EFT application software products.

  - The Corporate Services Division provides processing services to MCorp's member banks and utility processing to commercial industry clients (Commercial Services Division).

KEY PRODUCTS AND SERVICES

- MTech's 1985 noncaptive computer services revenue reached an estimated $99.9 million, a 27% increase over $78.8 million for 1984. A three-year summary of source of revenue follows:

MTECH
THREE-YEAR SOURCE OF REVENUE SUMMARY
($ millions)

FISCAL YEAR / ITEM	1985		1984		1983	
	Revenue	Percent of Total	Revenue	Percent of Total	Revenue	Percent of Total
Noncaptive computer services						
. Remote computing	$ 71.4	43%	$ 56.6	49%	$ 34.0	41%
. EFT processing	19.8	12	15.6	13	13.5	16
. Software products	8.7	5	6.6	6	4.6	6
Subtotal	$ 99.9	60%	$ 78.8	68%	$ 52.1	63%
Captive computer services (a)	$ 46.2	28%	$ 26.8	23%	$ 21.3	26%
Hardware sales (b)	$ 15.3	10%	$ 9.5	8%	$ 6.2	7%
Miscellaneous	$ 3.2	2%	$ 1.4	1%	$ 3.7	4%
Total revenue	$ 165.1	100%	$ 116.5	100%	$ 83.3	100%

INPUT

(a) Includes processing services provided through the Corporate Services Division to MCorp member banks.

(b) Includes sales and maintenance of terminals, CRTs, ATMs, and IBM micro-computers.

• The majority of MTech's remote computing services was derived from inter-active processing services provided to over 600 commercial banks and 150 thrifts located in 11 U.S. states.

- MTech currently processes eight million accounts and more than 120 million items monthly.

- Applications available include the following:

  • Management Information and Financial Control.

    - Financial Accounting: General ledger; automatic entries from P.O.D. (Proof of Deposit) and MPACT; cost center/profit center reporting; and budget variance.

    - Customer Information File (CIF): Customer account integration; suggested rate; cross sell marketing infor-mation; online alpha inquiry/name and address.

    - Audit Controls: audit confirmations and reporting; regula-tory examination reports.

  • Commercial and Personal Loan System.

    - Personal: Add-on interest installments; credit life; auto-matic coupon book ordering; officer performance reporting; delinquency reporting; credit bureau interface; single interest insurance; variable rate loans; indirect liability accounting; automatic drafts from deposit accounts; post payments online.

    - Personal Lending System: Simple interest installments; multiple rebate methods; multiple insurance options; irregular payment schedule; transaction backdating.

    - Commercial: Rate ceilings and floors; variable rate loans; multiple prime rate parameters; indirect liability accounting; post payments online.

    - Commercial Lending System: Commitment accounting; participant accounting; officer performance reporting; revolving credit lines; transaction backdating.

. Deposit System.

- NOW accounts.
- Super NOW accounts.
- Money Market accounts.
- Tiered rates.
- Variable interest.
- Online transactions.
- Combined statements.
- Descriptive statements with disclosure compliance.
- Bulk filing.
- Corporate cash management, including balance reporting, "paid item" account reconciliation, concentration (zero balance) accounts, and account analysis.
- Kiting suspect reports.
- Balance fluctuation reporting.
- Automatic drafts.
- Customized service charge routines.
- Certificate of deposit accounting.
- Savings accounting.
- IRA tracking.
- Online teller machines.
- Signature online.
- Proof deposit system.
- Daily exception item pull.
- Float capture and analysis, including deposit item counts and multiple transit distribution.

- MTech derived approximately $7 million in 1985 from utility processing services provided by the Commercial Services Division, compared to $6 million in 1984.

  - Approximately 35 clients in the oil and gas industries, government agencies, and financial institutions, access the division's data center in Dallas.

  - The data center operates IBM computers, running under DOS and MVS.

- MTech developed and operates MPACT, one of the nation's largest shared ATM networks for electronic funds transfer.

  - During 1985 986 MPACT ATMs handled over 70 million transactions. Over two million MPACT cards have been issued to customers in Texas, Oklahoma, and New Mexico. As of February 1986, there were 542 participating financial institutions and over 1,100 ATMs installed.

  - MTech is working with First Signature Bank for the operation of a national ATM switch. MTech will be the only processor in the country to interface with CIRRUS and Plus networks.

INPUT

- In early 1985 the MPACT network was expanded beyond the Southwest with a proprietary network involving 14 ATMs in West Virginia converting to MPACT. MTech also has agreements with two other banks involving a total of four ATMs.

- During the first quarter of 1986 MTech installed an additional 70 MPACT ATMs in Safeway supermarkets.

- MPACT features include the following:

  . The MPACT Operations Maintenance System (MOMS) monitors every ATM in the MPACT network 24 hours a day and instantly reports any changes in their operational status.

  . Management information systems produce operational profile reports for each ATM identifying transaction volumes, user mix, peak usage times, and unactivated account information.

  . Nationwide interchange capabilities permit MPACT customers to use their cards in American Express Travelers Cheque machines and American Express green and gold cardholders can use their card in any MPACT machine.

  . MTech is a member of CIRRUS, a national ATM network. Under this program 42 million customers from 14 banking organizations covering 46 states and Canada have access to over 10,000 ATMs.

  . Switch capabilities allow MPACT to share with other ATM programs, such as Pulse and MoneyMaker in Texas and Express-Net in Arkansas. As a result, MPACT cardholders have access to an additional 1,700 ATMs. MTech also has agreements with regional MasterCard and VISA processors that allow those customers to use their cards in MPACT machines for cash advances.

  . MPACT can interface with MTech's processing services or operate independently.

- MTech also provides marketing and installation services to MPACT clients as well as ATM network management.

- In 1984 MTech introduced its MPACT EXPRESS point of sale (POS) program in Texas.

  - MTech has agreements with over 165 retailers that have contracted to install over 10,000 POS terminals that will accept an MPACT debit card for payment of goods and services.

  - Participating merchants range from local, one-store operators to large chain retailers and include Mobil Oil, Exxon, AAMCO Transmissions,

INPUT

Pacific Stereo, Centennial Liquor, Southwest Airlines, Kroger, Tom Thumb Supermarkets, as well as clothing stores and entertainment ticket offices.

- Approximately $5.4 million of MTech's 1985 revenue was derived from EFT software product sales, compared to $5 million in 1984. These products, acquired from Information Processing Corporation in April 1983, include the following:

  - Action 2000 ATM (formerly the Universal ATM System) provides online control and processing of transactions from the ATMs of major vendors, including IBM, Diebold, NCR, and Docutel.

    - The system runs on IBM 370, 30XX, and 43XX computers under OS, DOS, and MVS, and on Tandem computers.

    - Transactions can be posted in a real time or memo post mode.

    - Options are defined through multibank System Control Records, allowing for different capabilities between owning institutions and using institutions via interchange.

    - Switching to major debit card authorization networks is also supported. Other features include settlement reporting, store and forward, and a "after hours" processing.

    - There are currently over 90 systems installed.

  - Action 2000 Super Switch (formerly Tandem EFT Super Switch) allows a financial institution to provide EFT switching between itself and other financial institutions as well as providing an interface to any national EFT switch network of which it may be a member.

    - Action 2000 Super Switch runs on IBM computers operating under CICS and on Tandem NonStop systems.

    - There are currently over 20 systems installed.

  - Action 2000 Point of Sale (formerly the Universal Point of Sale System) provides for the support of credit, debit, and travel and entertainment transactions, as well as support for check guarantee services, preapproval processing, and check verification.

    - The system runs on Tandem NonStop computers.

    - There are currently 10 systems installed.

  - The Action 2000 Credit Card System (formerly the "Only One" Credit Card System) provides credit card processing. The system runs on IBM 370, 30XX, and 43XX computers.

INPUT

- Approximately $1.2 million of MTech's 1985 revenue was derived from MTech Micro Services' microcomputer software sales to the banking and finance industry, compared to $1.6 million in 1984.

  - The target market for these products includes MTech's existing processing clients.

  - The software runs on IBM PC, PC-XT, and PC-AT microcomputers.

  - Applications available include the following:

    - Asset/Liability Management.
      - General ledger.
      - Planning and control.
    - Loan Pricing--Customer Profitability.
    - Financial Statement Analysis.
    - Financial Statement Tickler.
    - Inventory.
    - Personnel.
    - Safe Deposit.
    - Real Estate Documentation Tickler.
    - Dow Jones Portfolio Management.
    - Trust Accounting.
    - Office Call Tracking.
    - Stockholder Accounting.
    - Board Reports.
    - Graphics.
    - Spreadsheets.
    - Word Processing--Mailing List Maintenance.
    - Personnel Management.
    - Accounts Payable.
    - Lockbox Recordkeeping.
    - Letter of Credit Accounting.

  - MTech also provides networking capabilities via its MIS-ON-A-MICRO product. The software permits downloading of information from the MTech mainframe to a microcomputer in the client bank, or uploading of information from the bank's microcomputer to the MTech mainframe. The two modules of MIS-ON-A-MICRO include the following:

    - Financial Management allows the preparation of daily financial data and comparisons with yesterday's figures and tomorrow's projections.

    - Customer Profitability defines bank-customer relationships from a total profitability standpoint. A monitoring device defines what the bank wants as customer yield, and a report is prepared analyzing how to bring up that yield or profitability to desired levels.

INPUT

INDUSTRY MARKETS

- The majority of MTech's 1985 noncaptive computer services revenue was derived from the banking and finance industry. MTech also provides services to retailers through client banks, to the oil and gas industry, and to government agencies.

GEOGRAPHIC MARKETS

- Over 99% of MTech's noncaptive computer services was derived from the U.S. Less than 1% of revenue was derived from software sales outside the U.S. Approximately 90% of revenue was derived from the Southwest.

- MTech has 43 data centers, subsidiaries, and sales offices in 16 states: Arkansas, California, Colorado, Georgia, Illinois, Louisiana, Massachusetts, Minnesota, New Jersey, New York, Ohio, Oklahoma, Tennessee, Texas, Virginia, and West Virginia. The company has plans to expand its operations throughout the U.S.

COMPUTER HARDWARE AND SOFTWARE

- MTech currently operates data centers in the following U.S. cities:

  - Abilene (TX).
  - Alexandria (VA).
  - Austin (TX).
  - Beckley (WV).
  - Belpre (OH).
  - Bluefield (WV).
  - Boston (MA).
  - Chicago (IL).
  - Clarksburg (WV).
  - Corpus Christi (TX).
  - Dallas (TX).
  - Dunbar (WV).
  - Fort Smith (AK).
  - Fort Worth (TX).
  - Golden (CO).
  - Houston (TX).
  - Jacksonville (TX).
  - Lubbock (TX).
  - McAllen (TX).
  - New York City (NY).
  - Oklahoma City (OK).
  - Princeton (NJ).
  - San Antonio (TX).
  - Sherman (TX).
  - Shreveport (LA).
  - Texarkana (TX).
  - Tyler (TX).

INPUT

- Tulsa (OK).
- Victoria (TX).
- Waco (TX).
- Wheeling (WV).
- Wichita Falls (TX).

- MTech has computers from various manufacturers installed at its data centers. The Dallas data center has primarily IBM equipment.

- Bank and thrift processing clients access MTech data centers via leased lines. Distributed processing via microcomputers is currently available to clients by direct dial, with plans for leased line access. Ultimately, micro-computer users will be able to access MTech's data center via a proprietary network currently being developed by MTech.

INPUT

COMPANY HIGHLIGHT

NATIONAL DATA CORPORATION
One National Data Plaza
Corporate Square
Atlanta, GA 30329
(404) 329-8500

L. C. Whitney, Chairman, President,
and CEO
Public Corporation, OTC
Total Employees: 2,400
Total Revenue, Fiscal Year End
5/31/84: $139,027,000

THE COMPANY

- National Data Corporation (NDC) was incorporated in 1967 in Delaware to provide specialized data processing and facilities management services. NDC's primary services include cash management, credit card, information management, health care, and telemarketing processing, and professional services.

- NDC's fiscal 1984 revenue was $139 million, an increase of 9% over fiscal 1983 revenue of $127 million. Net income rose 9% from $11 million in fiscal 1983 to $12.1 million in fiscal 1984. A five-year financial summary follows:

NATIONAL DATA CORPORATION
FIVE-YEAR FINANCIAL SUMMARY
($ thousands, except per share data)

ITEM / FISCAL YEAR	5/84	5/83	5/82	5/81	5/80
Revenue	$ 139,027	$ 127,033	$ 125,877	$ 101,336	$ 84,104
. Percent increase from previous year	9%	1%	24%	20%	20%
Income before taxes	$ 20,647	$ 19,404	$ 18,834	$ 14,181	$ 11,232
. Percent increase from previous year	6%	3%	33%	26%	23%
Net income	$ 12,072	$ 11,040	$ 11,173	$ 8,242	$ 6,769
. Percent increase (decrease) from previous year	9%	(1%)	36%	22%	24%
Earnings per share	$ 1.03	$ 0.95	$ 0.97	$ 0.73	$ 0.61
. Percent increase (decrease) from previous year	8%	(2%)	33%	20%	22%

INPUT

- The above financials have been restated to reflect the acquisition of Libra Group, Inc. in October 1983.

  - NDC exchanged 272,165 of its common shares for all the outstanding stock of Libra. The acquisition was accounted for as a pooling of interests.

  - Libra provides software development and consulting professional services for health care applications, primarily to federal government agencies.

  - Libra had approximately 135 employees at the time of the acquisition. Revenue for the fiscal year ending May 31, 1983 was $7.1 million and net income was $190,000.

  - Libra now operates as NDC Federal Systems, Inc., a wholly owned subsidiary of NDC.

INPUT

NATIONAL DATA CORPORATION

● A revenue breakdown by service area follows:

NDC
REVENUE FROM OPERATIONS, BY SERVICE
($ thousands)

	5/84	Percent Increase (Decrease) From Previous Year	5/83 (a)	Percent Increase (Decrease) From Previous Year	5/82 (a)	Percent Increase (Decrease) From Previous Year
Data Processing Services						
- Cash Management	$ 28,256	7%	$ 26,464	5%	$ 25,237	17%
- Credit Card (b)	56,069	21%	46,189	16%	39,827	44%
- Information Management	23,226	(16%)	27,717	(11%)	31,165	21%
- Telemarketing	15,020	90%	7,916	58%	4,998	6%
- Health Care (c)	16,456	4%	15,757	33%	11,810	33%
- Miscellaneous	-	-	-	(100%)	430	(70%)
Subtotal	$ 139,027	12%	$ 124,043	9%	$ 113,467	26%
Facilities Management						
- ARCO	-	(100%)	2,990	(76%)	12,410	9%
Total Company Revenue	$ 139,027	9%	$ 127,033	1%	$ 125,877	24%

(a) Restated due to a reclassification of certain services within the Cash Management, Credit Card, and Facilities Management business segments.

(b) Includes other facilities management services revenue of $6,350,000, $5,953,000, and $4,961,000 for fiscal 1984, 1983, and 1982, respectively.

(c) Restated to include the results of Libra Group, Inc.

INPUT

- NDC management attributes fiscal 1984 revenue changes to the following factors:

    - Cash Management Services' revenue increased $1,792,000. Transaction volume accounted for $550,000 and price increases were $1,242,000.

    - Credit Card Services' revenue increased $9,880,000. Transaction volume increases of $11,289,000 were partially offset by price reductions.

    - Information Management Services' revenue decreases reflect the decline in the demand for timesharing services.

    - Telemarketing Services' revenue increases were due primarily to phone solicitation contracts with AT&T.

    - Health Care Data Services' revenue increases were due to sales of the new IBM PC-XT- and PC-AT-based Pharmacy Management System.

    - Facilities Management Services' revenue is no longer reported as a separate business segment as a result of the termination in October 1982 of the company's facilities management agreement with the Atlantic Richfield Company (ARCO) in connection with ARCO's discontinuance of its credit card.

    - Miscellaneous revenue in fiscal 1982 was principally from the sale of equipment. There was no revenue from this source in fiscal 1984 or 1983 due to the company's decision to discontinue this activity.

- Revenue for the three months ending August 31, 1984 was $33.8 million, a 1% increase over revenue of $33.3 million for the same period in 1983. Net income for the period declined 60% from $2.8 million to $1.1 million.

    - NDC management attributed these results primarily to a slower than anticipated rate of sales of new cash management systems and the delivery of new health care systems.

- NDC is currently organized into three groups as follows:

    - Corporate Financial Services Group includes the operations of Cash Management and Information Management Services.

    - Retail Services Group includes the operations of Health Care and Credit Card Services.

    - Network Resources Group primarily includes Telemarketing Services and Network Resources (credit card phone).

INPUT

- NDC subsidiaries include the following:

  - NDC Federal Systems, Inc., headquartered in Rockville (MD), formed with the acquisition of Libra, provides professional services to the federal government hospital health care market.

  - National Data Corporation of Canada, Ltd. (formerly National Communications & Data Company, Ltd.) markets cash management, credit card, and telemarketing services in Canada. This subsidiary is headquartered in Don Mills, Ontario.

  - NDC International, Ltd., headquartered in London, markets cash management services throughout Western Europe.

- NDC's principal competitors, by service area, include the following:

  - Cash management: Automatic Data Processing, Chemical Bank, and in-house data processing centers.

  - Credit card services: First Data Resources and various bank associations.

  - Information management: Comshare, Tymshare, and in-house data processing centers.

  - Telemarketing: Dial America and regional telephone answering firms.

  - Health care: Three PM Inc. (3PM) and PharmAssist.

KEY PRODUCTS AND SERVICES

- Approximately 86% of NDC's total fiscal 1984 revenue was derived from its various processing services, 7% from professional services, 5% from facilities management, and 2% from turnkey systems.

  - The company's Telemarketing Services segment also provides direct sales call assistance on behalf of its clients. This service represented approximately 5.6% of fiscal 1984 revenue.

  - Services for fiscal 1984 are segmented by NDC as follows ($ thousands):

	Revenue	Percent of Total
Cash Management Services	$ 28,256	20%
Credit Card Services	56,069	40
Information Management Services	23,226	17
Telemarketing Services	15,020	11
Health Care Services	16,456	12
	$ 139,027	100%

INPUT

- Cash Management Services, available to banks and their corporate customers, include the following:

  - NDC's Deposit Reporting Service permits electronic concentration of local bank deposits from an organization's remote locations into central banks for accelerated funds availability.

    - Deposit reports are compiled and transmitted to the concentration bank designated by the customer for the purpose of initiating funds transfer via depository transfer checks (DTCs) or electronic Automated Clearing House debits.

    - The same data is also transmitted to customer management. This service accelerates the availability of cash receipts, enforces systematic unit reporting, provides audit trails for reconciliation, and provides confidential handling.

    - Approximately 3,000 customers presently use this service and about 300 banks market this service to their customers.

    - In April 1984 NDC was chosen as a subcontractor to the Citizens and Southern National Bank (C&S) to serve as the data service facility for concentrating $140 billion in federal deposits annually, as part of a consortium of financial service firms selected by the U.S. Treasury Department's Bureau of Government Financial Operations (BGFO).

      - Designated depositories enter federal agency transfer and deposit information into NDC's computer network. NDC then submits this information to the Automated Clearing House (ACH) system in order to charge most depositories, develop data for wire transfers for depositors unable to meet ACH reporting deadlines, and provide a detailed accounting to BGFO of daily transactions.

      - The initial contract for these services is five years.

    - In mid-1983 NDC was designated by the Farmers Home Administration for automated concentration services to be implemented nationwide.

  - Bank Balance Reporting Services enable customers of participating banks to receive daily bank balance information so that cash management decisions can be made rapidly. Approximately 5,000 banks participate in this service, involving in excess of 7,500 corporate customers.

  - NDC's Money Transfer System allows corporate customers to initiate wire transfers through banks by terminals located at the customers' places of business. Instructions are forwarded by terminal to the

INPUT

sending bank for immediate processing. Twenty-four banks currently subscribe to this service.

- The Information Reporting Service provides customers with daily or other periodic consolidated management information collected from remote locations, such as data on sales, payroll, disbursements, inventory, and deposits. Approximately 450 customers currently use this service.

- NDC also offers Foreign Exchange Reporting as a complement to its cash management services in the international area.

    • The service provides immediate and current exchange rate information for various foreign currencies in addition to spot rate information, future rate prediction, and comparative rate analysis of foreign exchange deposits and transactions.

    • Six bank customers currently subscribe to Foreign Exchange Reporting.

- The Cash Management Exchange$^{T.M.}$, introduced in 1980, is a cash management, financial, and reporting service that provides for the transmission and exchange of information and instructions, both to and from banks, their corporate customers, and other computers via NDC's on-line network.

    • Financial and transactional data available via the Cash Management Exchange includes multibank balance and account activity, depository transfer information, foreign exchange and money market rates, and securities transaction reporting.

    • The Cash Management Exchange receives financial information from more than 5,000 banks in 46 countries and provides financial information to some 7,500 corporations. Approximately 71 banks currently subscribe to the service.

    • Seven of the ten largest Japanese banks currently subscribe to the Cash Management Exchange. These banks are serviced by the company's Tokyo branch.

- NDC offers NETS$^{T.M.}$ (Network for Electronic Transactions) primarily to bank customers. NETS is a distributed processing network based on Tandem NonStop computers that allows banks to provide advanced financial services to large corporations and to the middle, retail, and consumer (personal computer) markets by linking microcomputers and terminals with NDC's network. Approximately 250 corporations are using the NETS system through subscribing banks.

- In early 1983 NDC introduced the Treasury Manager System, an IBM PC-based decision support system for treasury functions that can also be used to access NDC's Cash Management Exchange network.

INPUT

- Software modules are available to assist the corporate treasurer in determining net cash positions, analyzing debt and investment levels, forecasting cash, and providing cash ledger and general ledger data.

- NDC provides marketing support, training, installation, customer service, and maintenance for the system.

- Prices range from $8,000 to $20,000 for the average hardware and software configuration, plus ongoing usage fees. Existing IBM PC users can also license the software separately.

- In March 1984 NDC reached an agreement with Security Pacific National Bank to supply them with 1,600 Treasury Manager Systems to be installed in their customers' offices over the next 24 to 36 months.

- NDC provides timesharing through an arrangement with GEISCO in connection with some of its cash management services. The time-sharing capability, which is also offered through NDC's own network, allows each customer to store data and obtain reports that meet their specifications.

- The Cash Management Academy[T.M.] was established by NDC in 1982 to offer instruction to corporate and banking clients in the area of cash management theory and techniques.

- Credit Card Services include credit card charge authorization, card processing, and remittance processing for both bank and private label card plans.

  - NDC's credit card authorization services are presently being used by over 176 financial institutions in the U.S. and Canada that issue MasterCard and VISA cards.

    - NETS[T.M.] (National Electronic Transaction Service) is NDC's nationwide electronic point-of-sale authorization service for both credit cards and checks. Credit requests are transmitted from the merchant to NDC through the merchant's terminal, and the credit authorization is then relayed to the terminal by electronic display or audio response.

      - The service is also capable of supporting additional applications such as NDC's deposit, information, and balance reporting services, and other cash management services.

      - Approximately 116 financial institutions are presently using NDC's electronic point-of-sale authorization systems.

INPUT

- Credit authorization is also provided by telephone voice and audio response authorization services.

  - NDC maintains seven regional voice centers that are staffed 24 hours a day, seven days a week.

  - Audio response authorization employs computer-synthesized voice responses to credit inquiries.

- The Total System$^{T.M.}$, is an on-line credit carding authorization and billing system jointly offered by NDC and a Columbus Bank and Trust Company affiliate.

  - The Columbus affiliate provides the credit card billing and merchant accounting portion of the service, and NDC provides the authorization and data entry components.

  - The system can process both MasterCard and VISA credits for the same customer.

  - A total of 73 banks, credit unions, and savings and loan associations currently use the system.

- NDC provides credit card processing services to 59 clients through its data entry service.

- Remittance processing services provided by NDC include depositing payments to a customer-designated account and providing same-day accounts receivable updates and summary reports. There are currently 23 customers using this service.

- NDC also provides credit card programs for airlines and petroleum companies to support their private label credit cards, including developing software and implementing total systems on a turnkey basis.

- In September 1983 NDC introduced the Electronic Data Capture Point-of-Sale System, offering merchants positive balancing at the point-of-sale, prior to depositing.

  - The system is delivered by either dial-up terminals or electronic cash register interfaces and operates in conjunction with NDC's NETS point-of-sale authorization system.

  - The system also provides for the storage and retrieval of sales tickets and daily activity reporting by store location.

  - There are currently four top retailers, representing over 5,000 locations, using the system.

INPUT

- In early 1984 NDC entered the public credit card telephone market by providing turnkey systems and transaction processing services.

  - The turnkey system will provide the telephone customer with step-by-step audio instructions on how to complete calls. The system completes computations involving call routing, call length, and credit card identification necessary for appropriate billing.

  - NDC is in the process of negotiating an agreement with a large nationally known manufacturer of public telephone terminals to be included as part of NDC's total system offering.

- Information Management Services provided include interactive remote computing, data base, graphics, and microcomputer-based processing services. There are currently more than 525 customers.

  - This division was created during fiscal 1982 in connection with NDC's acquisition of Rapidata, Inc.

  - Applications available on the network are shown in the exhibit.

    - Financial planning and control applications perform:

      - Capital budgeting and asset management.
      - Performance analysis and measurement.
      - Consolidated financial reporting and analysis.
      - Financial forecasting and budgeting.
      - Merger and acquisition analysis.

    - Banking and investment management services provide banks, investment firms, and corporate portfolio managers with accurate financial data and administration and reporting systems for:

      - Asset liability management.
      - Portfolio accounting and management.
      - Branch performance reporting.
      - Consolidations and multiyear planning.
      - Account profitability analysis.

    - Market planning and control services provide analysis, reporting, graphic, and modeling capabilities, including:

      - Sales forecasting and analysis.
      - Product planning and pricing.
      - Site selection.
      - Market simulation.
      - Media allocation.
      - Market share analysis.

INPUT

EXHIBIT

INFORMATION MANAGEMENT SERVICES NETWORK PROFILE

APPLICATION AREA/PRODUCT NAME

- OPERATING ENVIRONMENT
  - DEC 10/70, 10/90s, 2020s, TOPS-10 OS
  - HONEYWELL 437s, CUSTOM OS
- PROGRAMMING LANGUAGES SUPPORTED
  - ASSEMBLER
  - BASIC
  - COBOL
  - FORTRAN
  - PL/1
- DATA MANAGEMENT SOFTWARE
  - DBMS-10
  - PROBE
  - X2C
  - XPLOR
  - ACCENT R
- DATA MANAGEMENT AND REPORTING SYSTEMS
  - RAPIDTAB
  - RIPS
- DATA BASES AVAILABLE
  - BALANCE OF PAYMENTS
  - BAMACS (BANK OF AMERICA MONEY AND CREDIT STATISTICS)
  - BONDS (OTC BOND MARKET)
  - CITIBASE (CITIBANK ECONOMIC DATA BASE)
  - CITIBASE-WEEKLY (MONEY SUPPLY STATISTICS)
  - CITIBANK FORECAST DATA BASE
  - FEDERAL RESERVE BANK OF SAN FRANCISCO (FLOW OF FUNDS)
  - IFS (INTERNATIONAL FINANCIAL STATISTICS)
  - MARKET STATISTICS – DEMOGRAPHIC DATA BASE
  - NBER (NATIONAL BUREAU OF ECONOMIC RESEARCH FINANCIAL DATA BASE)
  - RAPIDQUOTE II (SECURITIES DATA BASE)
  - VALUELINE
  - ZIP CODE DEMOGRAPHIC DATA BASE
  - TELERATE II (DOMESTIC AND INTER-NATIONAL HISTORICAL DATA BASES)
  - FINSTAT (CORPORATE FINANCIAL STATEMENT)
  - CONFERENCE BOARD (ECONOMIC TIME SERIES)
  - DRENNAN-CHR NEW YORK REGIONAL ECONOMIC DATA BASE

APPLICATION AREA/PRODUCT NAME

- FINANCIAL APPLICATIONS/TOOLS
  - CAPBUD (CAPITAL BUDGETING)
  - CPFA (CAPITAL PROJECT FINANCING ANALYSIS)
  - CPTRAC (CAPITAL TRACKING)
  - CASH FLOW ANALYSIS
  - CASH MANAGEMENT SYSTEM
  - CLIENT GENERAL LEDGER
  - FISCAL (FINANCIAL MODELING LANGUAGE)
  - MONITAUR: PORTFOLIO MANAGEMENT SYSTEM
  - TITAN
  - ZBB (ZERO-BASED BUDGETING)
  - FUTURECASH (FINANCIAL MANAGEMENT FOR BANKS)
  - FDMS (FINANCIAL DATA MANAGEMENT SYSTEM)
  - SECURITIES TIMING ANALYSIS PROGRAMS
- GRAPHICS
  - GRAPHICS
  - GRAPHS
  - PROBE GRAPHICS
- TELEPHONE COMPANY APPLICATIONS
  - ANALIT (ANALYSIS OF LINE INSULATION TESTS)
  - ESS CUTOVER (CENTRAL OFFICE CUTOVER ANALYSIS)
  - FADS (FORCE ADMINISTRATION SYSTEM)
  - TOUR (TOUR SCHEDULING)
- OTHER KEY PRODUCTS
  - BACKGROUND-10
  - RAPIDVOICE
  - RAPIDLINK
  - SPSS-10
  - SXU, DXU
  - HUMAN RESOURCES INFORMATION SYSTEM
  - STATE SPACE FORECASTING (TIME SERIES FORECASTING)
  - RITE (INTERACTIVE TEXT EDITOR)
  - RID (INTERACTIVE DEBUGGER)

INPUT

- Money management services used by treasurers in medium- and large-size corporations include:

    - Balance and disbursement reporting.
    - Float and cash forecasting.
    - Deposit concentration and lockbox reporting.
    - Anticipatory drafting.

- Key proprietary software applications include the following:

    - FISCAL, a financial modeling language for preparation of financial statements, plans, and analyses.

    - PROBE®, an analysis, forecasting, and reporting language for time series and cross-sectional data.

    - GRAPHICS, available on the network and as a software package, produces charts, graphs, plots, histograms, and other display formats. The software runs on DECSYSTEM-10 and -20 equipment and licenses for $25,000.

- The MicroService links microcomputers at customer locations with NDC mainframes.

    - In August 1983 NDC announced the CALC-PLUS S.M. Service, linking users of VisiCalc and SuperCalc to NDC's remote-access host computers and permitting them to use NDC's decision support software, network services, and data communications capabilities.

    - In August 1983 NDC announced it had entered into a joint venture with Mini-Systems Institute of Orange (NJ) to provide educational microcomputer workshops to the business community.

    - In June 1983 the division announced the Community Bank Workstation, a line of microcomputer-based applications software for the IBM PC and NorthStar Advantage; it is targeted to small- and medium-sized ($10-200 million in assets) community banks. Applications are available for Spread Analysis and Planning, Due from Banks Control, Safe Deposit Reporting, and Loan Exception Reporting. Packages range in price from $1,500 to $3,500.

    - Other MicroService offerings include configuration and software consulting, turnkey applications development, and a microcomputer rental program.

- In August 1983 NDC entered into a new three-year service agreement with the New York Telephone Company to provide dedicated processing and programming services on large-scale DEC equipment. The contract is valued at over $17 million.

INPUT

- Telemarketing Services are provided to retailers and advertisers who market their products by television and newsprint advertising, direct response mail, and catalogs to the "shop at home" buyer. A broad range of services are available 24 hours a day, seven days a week.

  - In connection with its Merchandise Ordering Services, NDC operators answer the phone in the client's name, take the order, enter the order in a central data base, and provide the client with a complete order record at the end of each day. NDC can prepare and deliver orders using the client's own order and report forms, and can provide credit card authorization for the caller at the time the order is placed.

    . In 1983 NDC was awarded a contract by AT&T to process customer postal solicitations relating to the purchase of currently leased telephone equipment. The contract contributed approximately $2 million to fiscal 1984 revenue.

  - Merchandise Marketing and Market Analysis Services provide the client with information on television advertising effectiveness. Associated consulting services are also available.

  - Dealer Locator Services direct the telephone caller to the nearest location for a specific product or service.

  - During fiscal 1984 NDC expanded its telemarketing services to include direct telephone sales on behalf of its clients. A major user of these services is AT&T.

  - Other services include:

    . Dedicated out-WATS solicitation projects.

    . Consulting and fund raising programs.

  - NDC has regional telemarketing centers located in Reno (NV), Lombard (IL), Toronto, Cherry Hill (NJ), Miami, and two in Atlanta, equipped with over 1,000 computerized operator positions.

- NDC's Health Care Services Division provides processing services and turnkey systems for pharmacy management and, as a result of the Libra Group acquisition, offers professional services (primarily to the federal government).

  - NDC's primary health care product is the DataStat® family of Pharmacy Management Systems.

    . The on-line DataStat system provides access to central NDC mainframes through Data General minicomputer interfaces and ADDS remote terminals located at customer sites. Over 100 clients now access NDC's network for on-line health care processing services. Most of these customers are converting to the

INPUT

NDC IBM PC-AT system as the retail pharmacy on-line system is being discontinued.

- DataStat enables the pharmacist to maintain patient profiles and to perform prescription processing and screening, drug interaction analysis, private and third-party billing, pricing, price updating, inventory control, drug reordering, accounts receivable, and claims processing. Workload and utilization reports are also produced.

- The DataStat product line includes systems for independent retail pharmacies, pharmacy chains, and pharmacies serving nursing homes, health maintenance organizations and clinics, long-term and acute-care hospitals, and government-operated pharmacies.

- DataStat-PC, introduced in 1983, is an IBM PC-XT- or AT-based turn-key system designed for small- to medium-sized pharmacy users.

  - NDC's initial DataStat-PC product was designed for the retail pharmacy. Versions for nursing homes and hospitals are also available.

  - DataStat-PC is priced at $11,995, including hardware, software, and 10 megabytes of IBM Winchester disk. Options permit interaction with TEC-America point-of-sale terminals.

  - DataStat-PC fills, refills, and prices prescriptions; maintains patient profiles; processes third-party claims; and prepares management reports. A communications interface allows access to NDC's network for price updating, data base updating, and third-party billing functions.

  - NDC announced during the first quarter of fiscal 1985 that, because of the strong acceptance of DataStat-PC by retail pharmacies, it was discontinuing its on-line processing service to this market segment. The company expects most of the current on-line customers will convert to the micro-based product.

- DataLink T.M., for large drugstore chains, is a payment systems interface between DataStat and NDC's credit card authorization and check guarantee network. A cash management interface allows the pharmacy system to use NDC's cash reporting and financial services.

- NDC Federal Systems, Inc., formed with the acquisition of Libra Group, contributed approximately $6.3 million to NDC's fiscal 1984 revenue. This subsidiary provides professional services for health care applications, primarily to federal government agencies.

INPUT

- Services include:

  - Requirements analysis.
  - Facilities planning.
  - Site engineering.
  - Systems design, including distributed systems and data base management systems.
  - Hardware and/or software selection, procurement, and installation.
  - Facilities management, on the clients' equipment, at the clients' sites.

- Approximately 57% of fiscal 1984 Health Care Services revenue was derived from agencies of the federal government.

- Facilities management services revenue (reported in the Credit Card Services business segment) was $6.4 million in fiscal 1984.

  - NDC has facilities management agreements with major airline and oil companies under which NDC manages and operates the complete credit card programs for these companies. Services include new account processing; credit and collection; customer billing; remittance processing; accounts receivable accounting; preparation of management information and statistical reports; and other related administrative services.

INDUSTRY MARKETS

- A majority of NDC's fiscal 1984 revenue was derived from the banking and finance and retail industry sectors. The remainder of revenue was derived from petroleum, medical, airlines, and telephone industry clients and the federal government.

GEOGRAPHIC MARKETS

- Approximately 98% of NDC's fiscal 1984 revenue was derived from the U.S. The remaining 2% was derived from Canada, Japan, and Europe.

- U.S. branch offices are located in Ann Arbor, Boston, Cherry Hill (NJ), Lombard (IL), Dallas, Fairfield (NJ), Los Angeles, Miami, New York City, Reno (NV), Rockville (MD), San Francisco, and Tulsa.

- Foreign offices are located in England, Germany, Italy, Japan, Sweden, and Toronto.

INPUT

NATIONAL DATA CORPORATION

COMPUTER HARDWARE AND SOFTWARE

- NDC operates the following equipment:

  - At its headquarters in Atlanta and in communications centers located in Cherry Hill (NJ), Lombard (IL), Boston, Miami, Reno, and Toronto:

    - 3 Univac 1100/80s, 1100 OS.
    - 4 Univac 494s, Omega.
    - 8 DECSYSTEM-10s, TOPS-10.
    - 32 Data General ECLIPSE S/130s.
    - 4 DEC PDP-11/40s, IAS.
    - 15 DEC PDP-11/34s.
    - 2 Tandems.

  - At the Information Management Services' Fairfield (NJ) data center:

    - 6 Honeywell 437s, custom operating system.
    - 1 DECSYSTEM-10/70, TOPS-10.
    - 7 DECSYSTEM-10/90s, TOPS-10.
    - 2 DECSYSTEM-2020s.
    - 8 DEC PDP-11s (used as front-end processors).

  - At NDC Federal Systems' Rockville data center.

    - 1 Harris 300, Virtual Operating System.
    - 1 DEC PDP-11/34, MUMPS.
    - 1 DEC PDP-11/24, MUMPS.
    - 1 Data General 350, AOS, AOS/VS.
    - 1 Data General MV/8000, AOS, AOS/VS.
    - 1 Burroughs 1955, MCP.
    - 1 Altos ACS 8000-12.

- In addition, NDC installs DEC PDP-11/34s and -11/70s, Data General Eclipse S/130s and S/230s, and Texas Instruments 990 series minicomputers in support of its services.

- NDC's communications network uses leased lines, satellite, Telenet, WATS, foreign exchange, Comshare, and GEISCO. Toll-free or local telephone numbers serving 75 major cities are available.

  - Information Management Services' network can be accessed via RAPIDNET (a teleprocessing network that is used in conjunction with TYMNET); WATS and FX lines; or TELEX.

INPUT